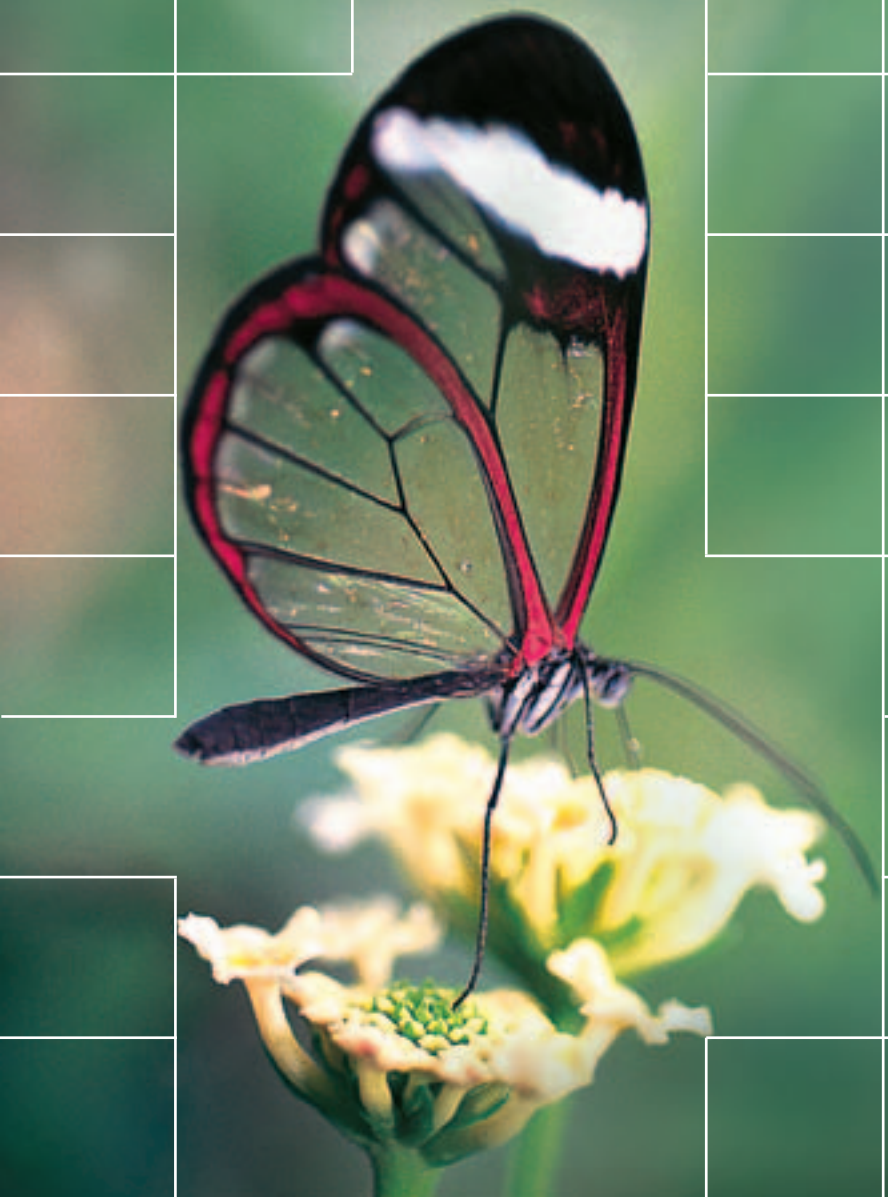
THE FUTURE CONTEXT OF THE CDM

REPORT PREPARED FOR THE HIGH-LEVEL PANEL ON THE CDM POLICY DIALOGUE



FINAL REPORT
July 2012

CDM Policy Dialogue

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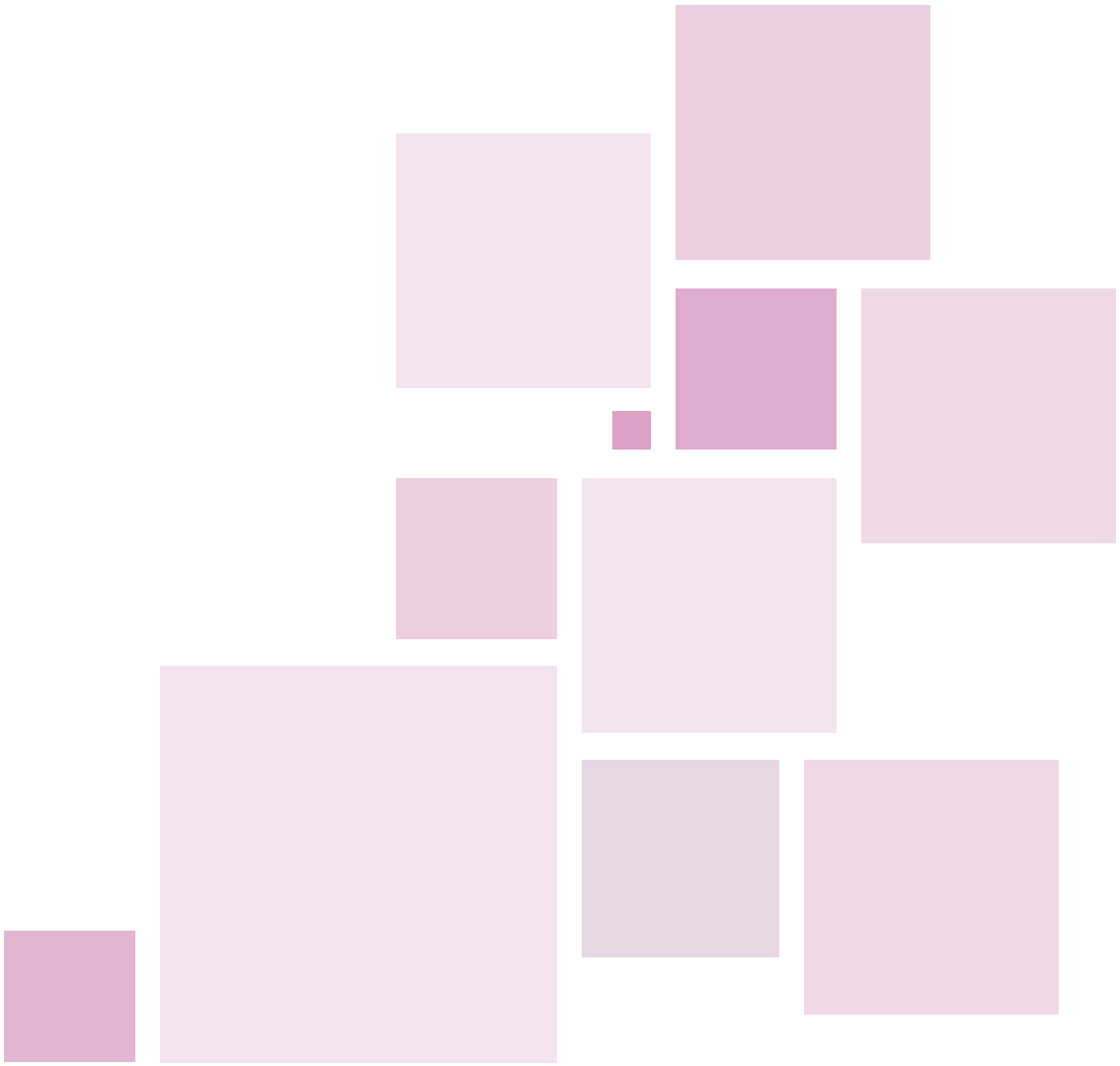

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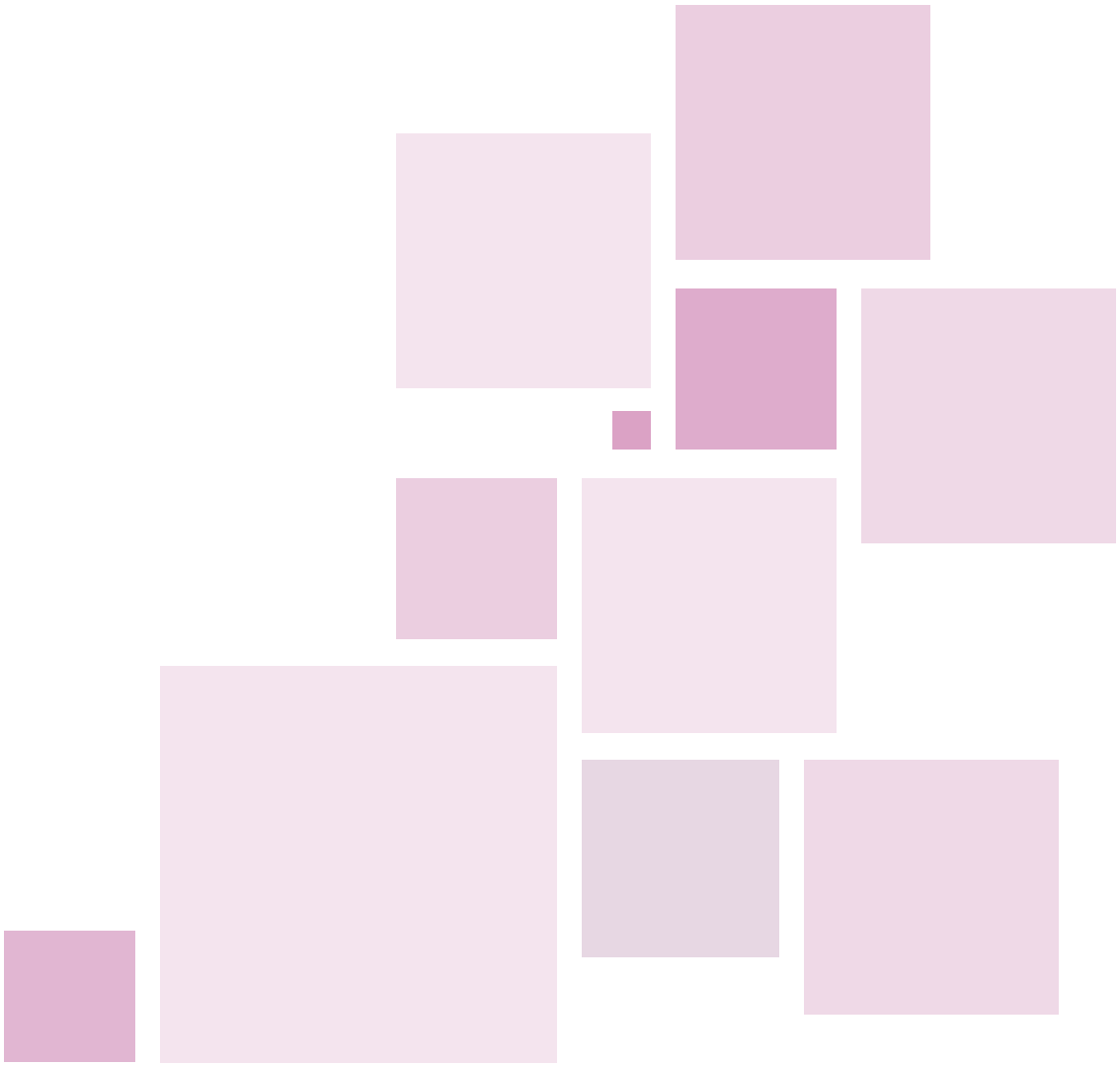
Executive summary



The executive summary responds to the questions set by the High-Level Panel on the CDM Policy Dialogue

What should the role of the clean development mechanism (CDM) be under each of the plausible scenarios of the future international carbon market?

Future developments in the international carbon market, and indeed the global climate policy architecture more generally, are uncertain. Two of the most important uncertainties are, firstly, the extent to which countries will adopt emissions reduction targets and, secondly, the extent to which the countries that do adopt targets will accept the use of international credits to meet them. These two factors will have a crucial impact on the role that the CDM can, and should, play in the future.

While stylised, Figure 1 provides one way of depicting these uncertainties and helps, therefore, to ascertain the potential role of the CDM in each of the different future scenarios:

- The horizontal axis represents the scope of countries which adopt targets or other formal commitments. The **western** edge of the diagram represents a future in which virtually all countries have targets which cover virtually all of their emissions; the **eastern** edge represents a situation in which there are no formal targets and coordinated international action has largely ceased. Midway between these two extremes we have the status quo, whereby some countries and sectors have formal targets, while others do not, and still other countries and sectors have targets which are less formal.

- The vertical axis represents the extent to which international offsets or credits, such as certified emission reductions (CERs), are used to meet a given set of targets.[1] The **northern** part of the diagram represents a situation in which a permissive approach is taken to the use of offsets. The empirical evidence suggests that moving away from project-by-project crediting, as practised under the current CDM, towards sectoral approaches, whereby emission reductions achieved by sectors are credited, would be one way to secure an expansion in volume. The **southern** part of the diagram reflects a situation in which the role of offsets and credits declines. This would correspond to a situation in which countries/regions with targets, such as the European Union (EU), decide to further restrict the extent to which offsets can be used to reach those targets. Targets would be met primarily through domestic emission reductions. In this situation, the *trading* of emission rights amongst those who are subject to caps, be it governments or subnational actors, would assume greater importance. Again, the status quo is in the middle of these two extremes: the current climate policy architecture involves elements of trading (such as the international emissions trading of assigned amount units) and elements of crediting (such as the current CDM).

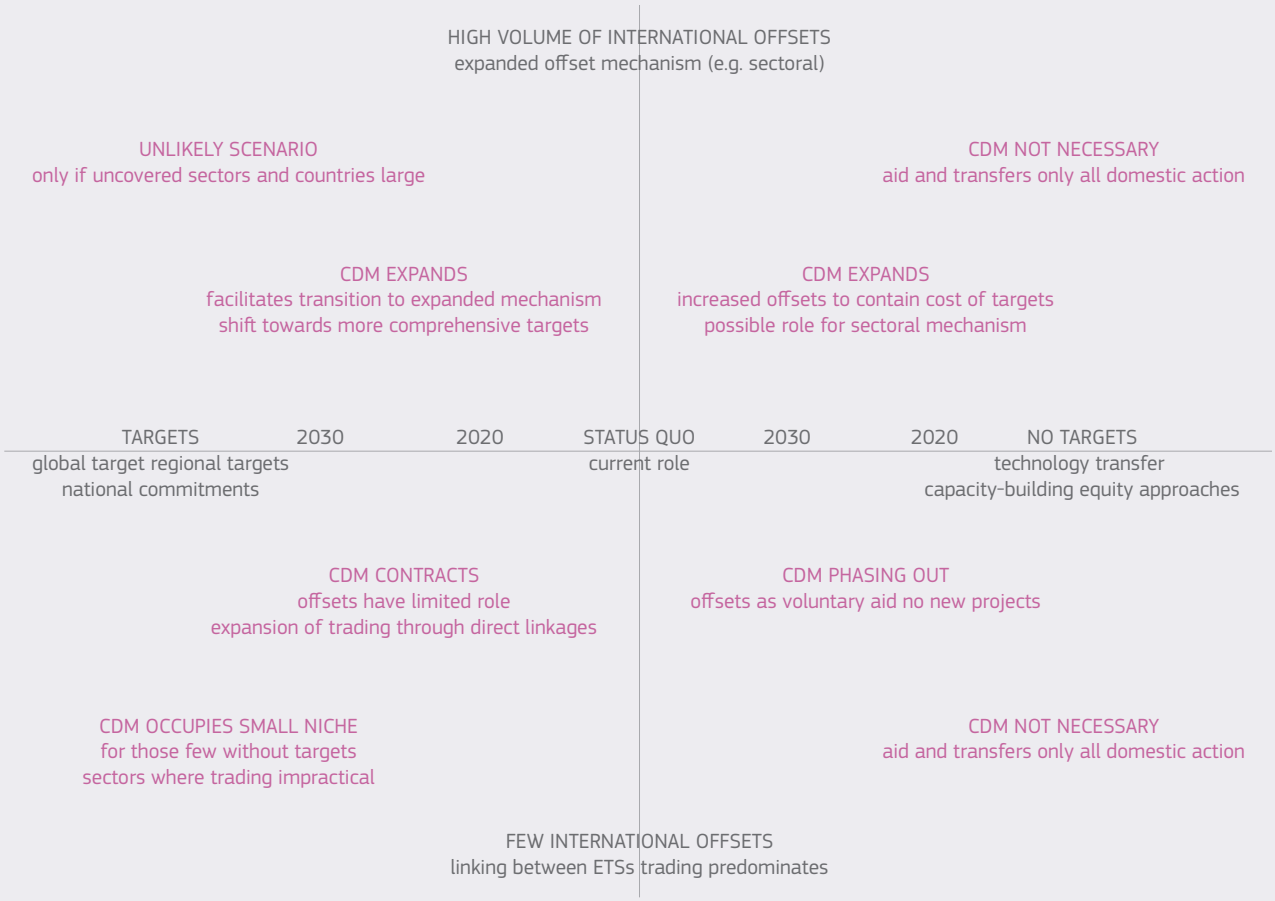
Some of the combinations within the diagram represent more plausible – and logical – combinations than others. For instance, the combination of no targets and international emissions trading or the combination of universal targets and extensive crediting are unlikely to be particularly relevant. Further, depending on the timescale of the transition to the final state of the climate policy architecture, it may be that international climate policy sits in a temporary location partway between its start and end points for many years.

Given the policy space depicted in figure 1, different roles for the CDM can be identified:

- In the status quo, the CDM can play an important role in providing the countries that have adopted formal emission reduction targets with access to lower-cost emission reduction opportunities and in providing capacity-building for low-carbon development in CDM host countries. In doing so, it can also provide a means of 'indirect linking' between different emissions trading schemes (ETSs), when those trading schemes would be unwilling to sacrifice the regulatory independence that would be required to make direct linking possible. The CDM will continue to play this important role for, at

1 Such international offsets are issued whenever uncapped installations, sectors or countries achieve emission reductions below a certain baseline. In contrast with under emissions trading schemes, emissions in excess of the baseline are not penalised other than through the loss of the opportunity to generate credits. If the emission reductions in the uncapped sector or country can be achieved at low cost, then those subject to targets may find purchasing such credits to be a cost-effective way of meeting such targets.

Figure 1. The future role of the CDM depends on the evolution of the climate policy architecture



Source: Vivid Economics.

Notes: The timelines should be considered to be indicative only and depend upon the progress of relevant international negotiations; ETSs = emissions trading schemes.

least, the next 10 years or so, and possibly longer if the relevant international negotiations result in a largely unaltered distribution of emission reduction targets. The CDM is currently undergoing a programme of reforms (e.g. adopting standardised baselines).to increase its effectiveness in performing its role. These reforms are discussed more fully in the report prepared for the CDM Policy Dialogue on the governance of the CDM by Classen et al. (2012). However, without action to raise the price of offsets generated under the CDM, there is the risk that the market will cease to function effectively in the status quo.

- If the relevant international negotiations end up in a shift to the far west of the diagram, then the role of the CDM, and of crediting mechanisms as a whole, is likely to decline (i.e. there will be a simultaneous shift to the south). This is because most countries would be responsible for achieving their own emission reduction targets and so there would be limited incentive for them to either provide or buy offsets from an international crediting scheme. However, even in a far westerly position, some crediting (either project-by-project or sectoral) is likely to be required for the least developed countries or sectors where trading is difficult. Further, the expansion of emission reduction targets need not be associated with a willingness to directly link ETSs, which would provide a further justification for some form of crediting mechanism. This limited crediting role could be performed by the CDM. Depending on the scale of sectors and countries not covered by a cap, there may be no need for a significant expansion of the current volume of offsets.

- However, a more modest (or temporary) shift to the west of the diagram could, in some circumstances, see an enhanced role for crediting mechanisms. With more countries adopting emission reduction targets, there could be an even greater focus on ensuring that this can be achieved in a cost-effective manner, which

could be delivered by increasing the volume of available offsets; that is, a simultaneous shift both northwards and westwards. This additional volume could be provided by the CDM, although a significant expansion of the volume of offsets may require a shift away from the current project-by-project approach to crediting towards a more sector-based approach. This could be accommodated either by means of a new mechanism or by undertaking incremental reforms of the CDM in terms of, for example, project boundaries, mitigation drivers, determination of baselines and approval of methodologies.

- If the climate policy architecture moves eastwards in the diagram then the role of the CDM (and of crediting mechanisms as a whole) also begins to decline. To the extent that there is action, it would be in the form of non-binding emission reduction targets and other actions such as technology development and transfer. Under this scenario there is a limited future for all offset mechanisms, including the CDM, as there are no commitments to use offsets to meet.

However, although the CDM needs to be flexible in order to respond to such changes in the international context, the design of the CDM can also help to shape the direction of travel. This is particularly relevant in the context of the general consensus that it is imperative to move towards the west of the diagram (which, as argued above, would be likely to be accompanied by a move southwards) if dangerous climate change is to be avoided. To give two examples:

- The CDM could adopt differentiated discounting for different project types or for projects from different regions. Such an approach would begin to remove the binary distinction between countries that have emission reduction targets and those that do not, while also potentially helping to alleviate the current oversupply of credits in the CDM market. An alternative proposal with the same effect would be to differentiate the approach taken to the determination of baselines in different CDM host countries on the basis of per capita income or emissions: namely, in relatively prosperous countries setting a baseline that already requires a certain percentage of emission reductions below current trajectories and only crediting emission reductions below that baseline.

- Many stakeholders have pointed out that, as well as issuing credits, offset mechanisms can play an important role in both increasing the realisation of broader social, environmental and developmental benefits delivered by some emission reduction activities in CDM host countries, and developing the technical capacity and market infrastructure that will be needed if CDM host countries are ultimately to adopt their own emissions trading architecture. These arguments provide a justification for offset mechanisms, such as the CDM, over and above their role as a mechanism for generating credits. As a particular example of the second point regarding technical capacity, it has been suggested by some that sectoral crediting mechanisms may have an important role in the transition to a greater prevalence of ETSs, as they will necessitate the development of inventories and monitoring, reporting and verification arrangements. The empirical evidence to back up this conjecture is, to date, necessarily limited as sectoral crediting mechanisms have not been widely deployed. The argument, in effect, envisages that the climate policy architecture **initially** needs to move to the north of the diagram (or to the north-west), even if this is not justified by the need to supply more credits per se, as a necessary condition for a **subsequent** move to the west (or south-west). There are tensions in this argument, however, as it is also plausible that the greater scale of offset generation by, and the associated financial flows from, a sectoral offset scheme – without any further reform – could actually provide a disincentive for the wider geographical spread of emission reduction targets. The fact that a number of CDM host countries are proposing domestic ETSs also suggests that such technical experience is being delivered to some extent by the current CDM. Further, such a transition needs to be carefully managed in order to avoid contributing to a glut of credits in a market that is at present already characterised by oversupply. Despite these caveats, and as discussed further below, modest reforms within the CDM to support learning-by-doing in relation to sectoral approaches seems advisable.

The roles identified above for the CDM could be performed by an alternative, newly created, global offset mechanism, such as, some envisage, the new market mechanism (NMM). While there has been criticism of the CDM's performance in a number of regards, as discussed in the report on the governance of the CDM by Classen et al. (2012), many improvements have been made in recent years and further reforms are under way and/or recommended. Given the experience and expertise that has been established within the CDM, it is likely to be more prudent to use the existing institutions to continue to trial modest reforms, especially while there is uncertainty about the future climate policy architecture, rather than to create an entirely new mechanism. This approach appears to be broadly supported by stakeholders.

In the light of the emergence of other carbon mechanisms, what is the CDM's comparative advantage? What role, if any, should the CDM play in improving standards for carbon mechanisms around the world?

The CDM has a number of comparative advantages over other domestic and international offset mechanisms.

The CDM covers a large part of the world and can therefore access more cost-effective emission abatement options than emerging schemes, which tend to have a more limited geographical focus. Emerging domestic offset schemes are even more limited in the number of abatement options that they can access. Offset mechanisms based on a sectoral approach, however, might be more cost-effective than the current CDM with its project-by-project offset generation if there is a need for a greater volume of credits, as such regimes could be scaled up substantially and generate many cheap credits. Although high transaction costs associated with CER acquisition reduce the cost-effectiveness of the CDM, promising ongoing reforms and institutional learning, including standardisation by introducing benchmarks and default parameters for certain projects, the reduced length of the project cycle and other improvements in governance, are likely to lower such costs.

The CDM has faced criticism that many CDM projects are non-additional and the offsets are therefore lacking in environmental integrity. There is no evidence that emerging mechanisms will perform better in this regard: the methodologies of mechanisms such as the Japanese Bilateral Offset Credit Mechanism and the Australian Carbon Farming Initiative are, in fact, often based on CDM methodologies, and there is also a risk that simplified approval procedures, such as those proposed under some alternative mechanisms, will simply result in a greater proportion of non-additional projects. In addition, other offset standards, such as those developed for the Californian cap-and-trade program, are less reticent about allowing REDD+[2] offset projects, the long-term environmental benefits of which are less certain than those of CDM projects have been to date (although, as noted below, careful design may help to overcome the concerns regarding environmental integrity). The CDM's established rulebook and institutional capacity and its history of scrutinising methodologies and projects on the basis of environmental integrity would further suggest that its performance with regard to ensuring environmental integrity would be stronger than that of other emerging mechanisms, at least in the short to medium term.

The CDM has been criticised for not generating sufficient sustainable development benefits. However, as stated in the report prepared for the High-Level Panel on the CDM Policy Dialogue on the impact of the CDM by Spalding-Fecher et al.(2012), most studies conclude that the CDM has contributed to sustainable development, with renewable energy projects being perceived as particularly beneficial. It is as yet unclear whether the project mix associated with the emerging mechanisms will be more or less supportive of sustainable development objectives. The oversight provided by the Conference of the Parties (COP), and the established procedures that allow CDM host countries to align domestic CDM project development with the sustainable development objectives of their domestic policies, suggest that the CDM may have institutionalised sustainable development at least as much as any other mechanism would be able to.

These advantages of the CDM can play an important role as new mechanisms emerge. Indeed, it is clear that the CDM is already playing an instructive role: its extensive rulebook and vast array of project methodologies already serve as a learning platform for emerging mechanisms. For instance, it appears probable that China's rules on offsets for its domestic offset scheme will allow the fast-tracking of projects that have received approval from the CDM Executive Board but which have not issued credits. The CDM could further leverage this instructive role by pursuing limited sectoral crediting or the crediting of REDD+ projects, enabling learning-by-doing in relation to these approaches and serving as a credible learning platform for experimentation. This is discussed in more detail later in this executive summary. The CDM may also consider an explicit programme of outreach to emerging offset programmes and setting out a road map by which the CDM could recognise top-performing emerging offset programmes as being 'CDM-equivalent'.

More fundamentally, the CDM has the potential to play an important role in helping with the gestation of new carbon policies and ETSs around the world, the latter, as they emerge, being able to draw upon the standards and procedures of the CDM. As many stakeholders have commented and as detailed in this report, it is arguable that the CDM has played a role in the development of the regional – and subsequently national – cap-and-trade programmes to be launched in China and elsewhere. The CDM could, in a similar vein, help to accelerate this process in a variety of countries by expanding the geographical scope of its projects,

2 REDD+ denotes the reduction of emissions from deforestation and forest degradation, with the plus indicating sustainable management of forests, conservation of forest carbon stocks and enhancement of carbon stocks.

developing a hybrid system of governance that empowers local actors and, as these schemes emerge, expanding its outreach to them to encourage the fungibility of CERs (as discussed below). It is possible that the CDM will be more effective in this role if it begins to develop methodologies with sector-based crediting approaches.

In the light of the emergence of new carbon markets outside of the UNFCCC and the European Union emissions trading scheme, what role, if any, should the CDM play in directly issuing credits to those markets?

Carbon markets are emerging around the world. Several countries and regions are in different stages of implementing carbon markets, including Japan, Australia, New Zealand, California and Quebec, South Korea, China and Brazil. These countries are all considering the use of carbon offset mechanisms to achieve part of their emission reduction targets. Although the CDM is the largest international offset mechanism today and can, in principle, be used by any carbon market, the new carbon markets are also considering other options, such as using predominantly domestic offsets or developing their own international offset mechanism. This raises the question of whether a world in which there is a proliferation of offset mechanisms is desirable, or whether the CDM should actively aim to issue credits to the new carbon markets and become the dominant global source of offsets.

The current analysis indicates that a role for the CDM in issuing credits to these markets is broadly desirable from the perspective of three objectives, namely harnessing cost-effective emission reductions for Annex I countries, promoting sustainable development and encouraging mitigation action in a broader range of countries.[3]

In terms of cost-effectiveness, the core economic rationale for allowing the fungibility of CERs is that it will provide a platform for the indirect linking of different carbon markets, increasing the cost-effectiveness of global emission reductions. Although the high transaction costs sometimes associated with the current CDM reduce the cost-effectiveness of emission reductions, the programme of reforms that is currently being implemented may be able to address this issue sufficiently. The CDM, due to its institutional capacity and the aforementioned reforms, may also be expected to outperform other options in terms of environmental integrity. The first objective of harnessing cost-effective emission reductions is hence better served by a common global offset mechanism with an improving degree of environmental integrity than by a proliferation of offset mechanisms (although an NMM could assume the same role).

Despite the criticism of the sustainable development benefits generated by the CDM to date, the governance of the CDM, with the substantial influence of CDM host countries, seems to ensure a comparative advantage of the mechanism in terms of securing sustainable development benefits. This further supports allowing the fungibility of CERs in new carbon markets.

Finally, new mitigation action in CDM host countries may crowd out CDM finance, on the one hand, as such government support may lead to double counting if an ETS is implemented to achieve an emission reduction target, or threaten the financial additionality of projects. On the other hand, host-country policies other than ETSs may complement the CDM neatly and thus actually improve the inflow of CDM finance. Thus, adding momentum to the CDM may not necessarily discourage CDM host countries from taking mitigation action themselves, but may in fact demonstrate the potential for emission reduction and build capacity for introducing ETSs at a later stage (although a sectoral approach would probably be preferable for building capacity for the transition to an ETS, subject to the costs of developing a new mechanism not being too high).

It is hence concluded that it is desirable for CERs to be fungible in new and emerging carbon markets, in order to provide a linking mechanism between carbon markets and to act as an anchor to keep standards harmonised across schemes. The CDM may need to adjust its governance structure to facilitate this expansion and encourage the range of emerging schemes to allow the use of CERs. Given the inevitable proliferation of standards, it may be desirable to maximise voluntary engagement by pursuing a less-centralised governance model, provided that the surrounding architecture can be made sufficiently strong to ensure environmental integrity. The experience of the UNFCCC in setting, monitoring and verifying standards suggests that it would be an appropriate body to carry out such tasks.

3 Note that there is some overlap between this analysis and that provided in response to the previous question: the CDM's comparative advantage relative to other offset mechanisms is very closely linked to whether or not CERs should be fungible in new and emerging markets.

Without prejudging the outcome of relevant global negotiations, should REDD+ have a place in the CDM and, if so, how could this be achieved?

The types of land-use activities included under REDD+ currently account for a significant proportion of greenhouse gas emissions and removals and are also a significant source of low-cost abatement. However, alongside the economic and environmental opportunity presented by REDD+, there are significant challenges involved in incorporating REDD+ into a market mechanism such as the CDM or the NMM.

Many of the issues which need to be addressed when considering the role of REDD+ in the CDM, such as the interaction between the CDM and sectoral crediting, expanded CDM methodologies and the future role of all offset mechanisms under various future scenarios, are pertinent to the wider debate surrounding the CDM. However, there are some issues which are specific to REDD+.

If REDD+ is to be included in the CDM, well-defined approaches exist under the current CDM and under likely reformed versions of the CDM that can facilitate this, each of which brings advantages and disadvantages. The benefits of including REDD+ in the CDM include: promoting sustainable development benefits (a core objective of the CDM); shifting the distribution of CERs towards a more equitable balance amongst countries (i.e. many forested developing countries do not have many opportunities for CDM projects in other sectors); the ability to generate cost-effective emission reductions (a second objective of the CDM); and additional learning-by-doing opportunities for both the CDM and REDD+.

The risks of including REDD+ in the CDM include: a possible lack of environmental integrity, leading to an increase in global emissions; the risk of oversupply of credits and price collapse; institutional risks to, and demands on, the CDM; damage to local communities and indigenous groups if projects are not implemented with appropriate safeguards; and prejudging the outcome of negotiations on both REDD+ and non-REDD+ issues. Careful design of the inclusion of REDD+ in the CDM should be able to mitigate many of these risks.

Based on the research and analysis conducted for this report, it is suggested that the High-Level Panel consider the following four options for including REDD+ in the CDM: (i) maintain the status quo and do not allow REDD+ into the CDM; (ii) allow some limited project-based REDD+ into the CDM; (iii) allow the larger-scale (subnational or national) reduction of emissions from deforestation activities into the CDM; or (iv) a combination of (ii) and (iii).

What should the role of sectoral mechanisms be in the future international climate policy architecture, particularly in relation to the CDM?

The role that sectoral mechanisms will play in the future climate policy architecture remains, at this stage, unknown. Depending on how the characteristics of the global climate policy architecture develop, sectoral approaches could take on a range of roles, from being unnecessary, through occupying an important role in a transition towards universal emission reduction targets, to being a tool for indirect linking.

Since the decision of the COP to define an NMM, the merits of sectoral approaches have been widely discussed. A number of Parties to the Convention have expressed strong support for a new mechanism that is sectoral, noting the potential to address leakage and the lower abatement costs. A sectoral mechanism could also provide a means for project host countries to develop the requisite infrastructure for adopting emission reduction targets. For these and other reasons, as described in this report, a number of emerging offset regimes are adopting sectoral crediting.

Others, however, oppose sectoral mechanisms. On occasion this opposition is based on ideological grounds. Other opponents of sectoral crediting question how such an approach will incentivise private-sector action. A particularly important concern is that there is insufficient demand, at least in the short to medium term, to absorb the supply of offsets that a sectoral mechanism may deliver. This oversupply would place further downward pressure on the price of offsets and could crowd out higher-cost projects that have desirable sustainable development outcomes. There are, however, options on both the demand and the supply side of the market for maintaining offset prices, including contingent baselines or an international carbon bank, though administration of these would erode the mechanism's cost-effectiveness.

There is little justification for sectoral mechanisms (either within or outside of the CDM) on the basis of a need for additional offsets at present: the existing CDM has shown it has the required capacity to address the demand for offsets, both now and in the short to medium term (say, to around 2018). In the light of this, were sectoral projects to

be introduced into the CDM at present, this would need to have a justification other than scale. There are a number of grounds: for instance, to facilitate the transition towards more widespread emission reduction targets by developing carbon-market capacity in CDM host countries, or to ensure that the technical expertise that resides within the CDM and the UNFCCC is utilised in the development of these mechanisms.

A further argument in favour of a gradual introduction of sectoral approaches is to prepare for the future. If the global climate policy architecture was expected to shift towards the adoption of universal emission reduction targets, then an expansion of the existing CDM to incorporate sectoral projects may be desirable, perhaps alongside baselines which differentiate between CDM host countries on the basis of per capita income or emissions, in order to provide a gradual transition to a broader range of commitments that are still consistent with the principles followed by the international community. A development towards such a policy space would be likely to require an expansion in the supply of offsets, beyond what is possible by means of existing mechanisms in their current state (even taking account of incremental reforms).

With this in mind, and despite the current lack of demand for offsets, a gradual introduction of sectoral projects into the CDM may be advisable as a way to address the inevitable teething problems that sectoral approaches will encounter. There are a number of reforms that would need to be undertaken in order for the CDM to either operate alongside or evolve into a sectoral mechanism, including changes to the concept of additionality, the requirement to adopt multiple baselines per credited initiative and changes to the definition of project boundaries. While these changes will take some effort to introduce, there are no insurmountable technical or economic barriers.

Should project-by-project offset generation, as currently carried out under the CDM, remain part of the future climate change mitigation architecture?

The role of project-by-project offset generation relative to other forms of international offset generation, with sectoral crediting being the primary alternative, will vary depending on the evolution of the global climate policy architecture, as shown in figure 2. Fundamentally, under most scenarios, as described below, any offset mechanism has a major role to play only temporarily, albeit that this 'temporary' role may last for a decade or more. In the event that either almost all countries adopt emission reduction commitments or that there is no progress in increasing the scope of countries with commitments, there will be a limited role for any offset mechanism in the long term. The nature of the transitional role depends upon the volume of offsets required.

If the number of countries adopting formal emission reduction targets declines, then the most plausible outcome is that there will be a limited role for a new mechanism and the existing CDM will be of sufficient scale to provide the necessary volume of offsets. Ultimately, if fewer countries adopt targets, it might be assumed that the countries with commitments over the next decade, such as those of the EU, would scale back their targets and the role of offset mechanisms would diminish. The role of the CDM would largely be to try to build up carbon-market capacities in developing countries in the hope that mitigation action might scale up again at some point further into the future.

If more countries adopt emission reduction commitments, then an expanded CDM, which may include or coexist with a sectoral mechanism, could play a transitional role in facilitating learning for the establishment of domestic ETSs, as the current CDM has done for China and South Korea, among others. While there would be fewer countries eligible to host credit-generating projects, it is likely that there would be a strong case for a limited role for project-by-project offset generation under this scenario. On the supply side, project-by-project offset generation would be appropriate for the countries whose level of development means that emission reduction targets are deemed inappropriate and for which sectoral mechanisms are unlikely to be relevant. On the demand side, both project-by-project and sectoral crediting could provide a means of indirect linking between different ETSs, noting that current experience suggests that direct linking faces barriers which make it difficult to implement, despite the economic benefits of such linking. Indirect linking through the CDM could provide many of the same benefits, but with fewer regulatory challenges.

If the number of countries with emission reduction commitments does not increase, then whether the appropriate offset mechanism should be project- or sector-based depends primarily on the volume of offsets required. The larger the volume of offsets required, the greater the value of a sectoral mechanism. However, there is also an important debate about whether a move to a sectoral mechanism might motivate, rather than simply respond to, additional mitigation action by countries that have yet to adopt emission reduction targets. Here, the underlying tension appears to be that sectoral mechanisms may increase the *capacity* of countries to adopt such targets and ETSs, by promoting

learning about emission inventories, benchmarks etc., but at the same time, potentially, and subject to their design, may reduce the *incentive* for such countries to adopt targets by increasing the possible flows of resources between the countries that do and do not adopt targets. However, the very limited experience with sectoral mechanisms to date means that there is little objective evidence and that this is primarily a political debate. What can be said is that the plans of China and South Korea suggest that the current project-based CDM has not proved a barrier to adopting domestic mitigation action in CDM host countries.

Should the CDM remain embedded in the United Nations/UNFCCC? If so, who should operate it?

The stakeholder consultations indicated that there was widespread support for the CDM remaining embedded in the UNFCCC. Specific options for improving the governance and administration of the CDM are presented in the report on the governance of the CDM (Classen et al., 2012). From the perspective of the future of the CDM, one of the key roles that the (possibly reformed) CDM, or a future NMM, could play is as an indirect linking mechanism between the various approaches being pursued both domestically and as a means to meet international commitments. This linking role can only be performed if the mechanism is transparent and appropriately governed. The experience built up within the CDM and the UNFCCC is extremely valuable in this respect.

Furthermore, the desirability of preventing parallel systems of certification from developing suggests that the CDM should consider ways in which it can engage with emerging schemes. One option would be for the UNFCCC to remain focused on promoting standardised principles (i.e. that each emission reduction unit should represent one tonne of mitigation), but beyond this to allow different countries to develop different standards or unit types. The COP could then determine which standards would be recognised from the perspective of meeting legal emission reduction targets, with the market providing a further peer review through differentiation of the price of credits according to perceptions of environmental integrity (similar to the divergence in prices for different forms of voluntary credits).

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List of acronyms

AAU	assigned amount unit
ARB	California Air Resources Board
AWG-LCA	Ad Hoc Working Group on Long-term Cooperative Action under the Convention
BOCM	Bilateral Offset Credit Mechanism
CAR	Climate Action Reserve
CDM	clean development mechanism
CER	certified emission reduction
CFI	Carbon Farming Initiative
COP	Conference of the Parties
DNA	designated national authority
DOE	designated operational entity
EB	Executive Board of the clean development mechanism
ERU	emission reduction unit
ETS	emissions trading scheme
EU ETS	European Union emissions trading scheme
GHG	greenhouse gas
IET	international emissions trading
JVETS	Japanese Voluntary Emissions Trading Scheme
LDCs	least developed countries
LULUCF	land use, land-use change and forestry
MAC	marginal abatement cost
NAMA	nationally appropriate mitigation action
NMM	new market mechanism
PoA	programme of activities
REDD+	reducing emissions from deforestation and forest degradation in developing countries, with the plus indicating sustainable management of forests, conservation of forest carbon stocks and enhancement of carbon stocks
RGGI	Regional Greenhouse Gas Initiative
RMU	removal unit
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
WCI	Western Climate Initiative

1. Introduction

Chapter contents

Introduction

This section briefly introduces the overall aims of the High-Level Panel on the CDM Policy Dialogue and explains why this is a timely intervention and the role of this research in helping to meet the aims of the High-Level Panel. It also explains the structure adopted for the rest of the report.

"The economic environment and state of global emissions have also changed drastically since the CDM was introduced in 1997."

1.1 The role of the High-Level Panel and the aim of this report

When the clean development mechanism (CDM) was first established in 1997, there were few expectations as to how it might perform. 15 years on, the mechanism has proven to be an unprecedented success, with over 950 million certified emission reductions (CERs) issued and some 4,300 registered projects. From its uncertain beginning it has emerged as the world's largest provider of emission offsets and a primary vehicle for channelling and leveraging finance from the public and private sectors to emission reduction projects in non-Annex I countries. Despite the mechanism's initial success, however, the CDM now faces a crucial point in its development. The global climate policy architecture, which has, hitherto, ensured the CDM's existence, is now shifting towards the development of new instruments in response to the perceived shortcomings of the CDM. Criticisms of the mechanism have become increasingly harsh over the course of its life, particularly those attacking the CDM's environmental integrity and performance in terms of addressing the Convention's goals. With the emergence of new mechanisms outside of the United Nations (UN) framework and, more recently, the defining of a broader mechanism under the auspices of the Conference of the Parties (COP), the role that that CDM should play in the future global climate policy architecture has become increasingly uncertain.

The economic environment and state of global emissions have also changed drastically since the CDM was introduced in 1997. Growth in global emissions has exceeded even the most pessimistic scenarios developed in the late 1990s, even though economic growth in many countries has been significantly lower than expected. Furthermore, emissions look set to maintain stronger than expected growth into the future, with large increases in the share contributed by non-Annex I countries (Burfurd, 2012).

To ensure that the CDM responds effectively to the changing climate policy architecture and broader economic context, the Executive Board of the CDM (EB) launched the CDM Policy Dialogue in 2011. The Dialogue, which is led by an external High-Level Panel comprising members from a broad range of professional backgrounds, seeks to engage stakeholders, critically analyse the role of the CDM and ultimately provide recommendations on how best to position the CDM for its effective use as a tool for achieving continued global action on climate change. The expected outcome of the Policy Dialogue is the publication of a comprehensive report analysing the future position of the CDM, its priorities and modes of operation.

This report is one of three commissioned by the High-Level Panel to facilitate its provision of recommendations. The objective of this report is to provide an in-depth analysis of the evolving context of the CDM, particularly with regard to new and emerging mechanisms, and to locate the CDM within the global climate policy architecture. The research takes a long-term view of the future challenges and evolving nature of the global response to climate change and addresses the issues of key importance to the CDM's operation. In particular, the report analyses: the rationale for seeking to make CERs fungible in new and emerging markets, besides those currently connected to the Kyoto Protocol; the potential for, and implications of, moving the CDM towards sectoral crediting, as well as the effect that this may have on the role of the CDM more broadly; and the potential for the current project-based CDM to remain a relevant component in the global climate policy architecture. These issues are assessed with particular regard to the current state and future development of the global carbon market and new and existing offset mechanisms. Specific attention is also paid to the role that REDD+[4] could play in the development of the CDM and whether any opportunities exist for collaboration between the two.

The remainder of this report is structured as follows:

- Chapter 2 describes a number of future scenarios regarding the role of the CDM within international climate policy.
- Chapter 3 elaborates on the role of the CDM in new and emerging carbon markets.
- Chapter 4 elucidates the potential for and desirability of the inclusion of REDD+ projects in the CDM.
- Chapter 5 presents an analysis of the relationship between sectoral mechanisms and the CDM.

4 REDD+ denotes the reduction of emissions from deforestation and forest degradation, with the plus indicating sustainable management of forests, conservation of forest carbon stocks and enhancement of carbon stocks.

This report has benefited from additional research undertaken for the High-Level Panel. Most importantly, the analysis of REDD+ in chapter 4 was undertaken by Climate Focus and Climate Advisers. While Axel Michaelowa provided valuable research on the future supply of and demand for offsets as well as description of new and emerging carbon markets and comparison of the CDM with other mechanisms. Such work is referenced as appropriate throughout the report. Work undertaken by the special expert advisers to members of the High-Level Panel also provided valuable input and is referenced as appropriate. All of this underlying analysis is available in the form of stand-alone papers.

2. Future scenarios for the CDM within international climate policy

There are a range of possible future scenarios for international climate policy and hence the CDM

Chapter contents

Future scenarios can be described for both the CDM and the global climate policy architecture more broadly

The future of the global climate policy architecture is inherently uncertain. There are a range of possible outcomes of the relevant international negotiations and a number of different transitional mechanisms that could be employed on the way to such an outcome. The role of the CDM, and of offset mechanisms in general, will vary depending on both the ultimate outcome of the negotiations and the path taken to said outcome. Two of the key elements which determine the relevance of the CDM are the extent and stringency of emission reduction targets and other commitments and whether international emissions trading (IET) or crediting mechanisms are the primary instrument used to meet such targets. In this chapter the range of possible scenarios for the future climate policy architecture and the associated role of the CDM are presented.

"The role of the CDM, and the priorities for reform, vary across different regions of the policy space."

2.1 The future policy space for the CDM

The CDM could have a major, minor, transitionary or no role, depending on the context

2.1.1 A framework for considering the future role of the CDM

In this section we build on the scenarios of short- to medium-term offset demand and supply and, taking a longer-term perspective, describe possible scenarios for the future global climate policy architecture and the potential role of the CDM under those scenarios.

Figure 2 presents the framework used for considering the future role of the CDM, using two key elements of the future climate policy architecture as the diagram's axes.

- The horizontal axis represents the scope of countries which adopt emission reduction targets or other formal commitments. The western edge of the diagram represents a future in which virtually all countries have targets which cover virtually all of their emissions; the eastern edge represents a situation in which there are no formal targets and coordinated international action has largely ceased. Midway between these two extremes we have the status quo, whereby some countries and sectors have formal targets, while others do not, and still other countries and sectors have targets which are less formal.

- The vertical axis represents the primary methods of achieving said targets, of whatever type. In particular, it captures the extent to which offsets or credits generated by emission reductions achieved in sectors or countries that are not subject to formal caps can be used for compliance purposes by countries and sectors that are subject to caps. At the southerly extreme of the diagram, such offsets shrink to a negligible amount – this would be the case, for instance, if the European Union (EU) and all other countries currently subject to targets decided to refuse to allow any CERs or other forms of offsets for compliance purposes. The only international transfer of resources in relation to emission rights would be through governments (or other actors) that are subject to caps, *trading* those rights (see box 1). The northern part of the diagram represents a situation in which the use of credits generated by emission reduction projects in countries not subject to caps (for compliance with targets) increases. A significant expansion in the volume of credits would plausibly be caused by a move away from project-by-project offset generation towards sectoral crediting or credited nationally appropriate mitigation actions (NAMAs). Again the status quo is in the middle of these two extremes: the current climate policy architecture involves elements of trading of emission rights between two parties both subject to caps (such as international trading of assigned amount units (AAUs)) and elements of crediting (such as the CDM).

The framework encapsulated in figure 2 has the status quo – with its mix of trading and crediting and situation of only some countries having emission reduction targets – at the centre of the diagram. Under this scenario only Annex B countries assume binding targets, while other countries can host CDM baseline-and-credit projects. Starting from the centre, the global climate policy architecture may evolve in different directions, over and above the current incremental reform of the CDM. Moving north from the centre corresponds to a greater use of crediting to comply with targets, which may plausibly be accompanied by a greater use of sectoral crediting schemes and a decline in the use of project-by-project crediting. Moving south, instead, corresponds to less use of international credits to meet any

Box 1. Definitions of trading and crediting systems

Trading systems set a binding cap on the total emissions of the covered entities, but permit allowances – corresponding to the right to emit a specific volume of emissions – to be traded among the covered entities, which are either nations or companies.

Crediting systems define a certain baseline, such as a business-as-usual projection, and only allow emission reductions that go below that baseline to be used as sellable credits. Here we consider baseline-and-credit systems as non-binding systems, meaning that there is no penalty if emissions remain above the baseline. Project-by-project offset generation under the CDM is an example of a non-binding baseline-and-credit system.

Figure 2. The possible future role of the CDM varies depending on the different combinations of the scope of emission reduction targets and the method employed to meet them

Source: Vivid Economics.

Note: The timelines should be considered to be indicative only and depend upon the progress of relevant international negotiations; ETSs = emissions trading schemes.

given target. Finally, moving west implies a broader adoption of binding targets, whereas moving east the number of countries with a well-defined and limited greenhouse gas (GHG) emission budget decreases.

It is important to note at least three aspects of the diagram and the associated depiction of the international climate policy architecture:

- Firstly, although the number of countries adopting emission reduction targets and the extent to which credits can be used to meet a given set of targets are separate issues,[5] some of the space in the diagram represents plausible combinations of targets and use of offsets, while other combinations are inherently implausible. For instance, in an extreme westerly position in the diagram all countries and sectors would be subject to formal caps, so there would be no uncapped countries or sectors from which to purchase international offsets, other than sectors for which caps were for some reason impossible. More generally, westerly positions in the diagram would tend to be associated with more trading and less crediting, as crediting only has a useful role where there are relatively large volumes of uncapped emissions. Likewise, in an extreme easterly position in the diagram there would be few or no countries with targets and hence no opportunities for the international trading of emission rights.

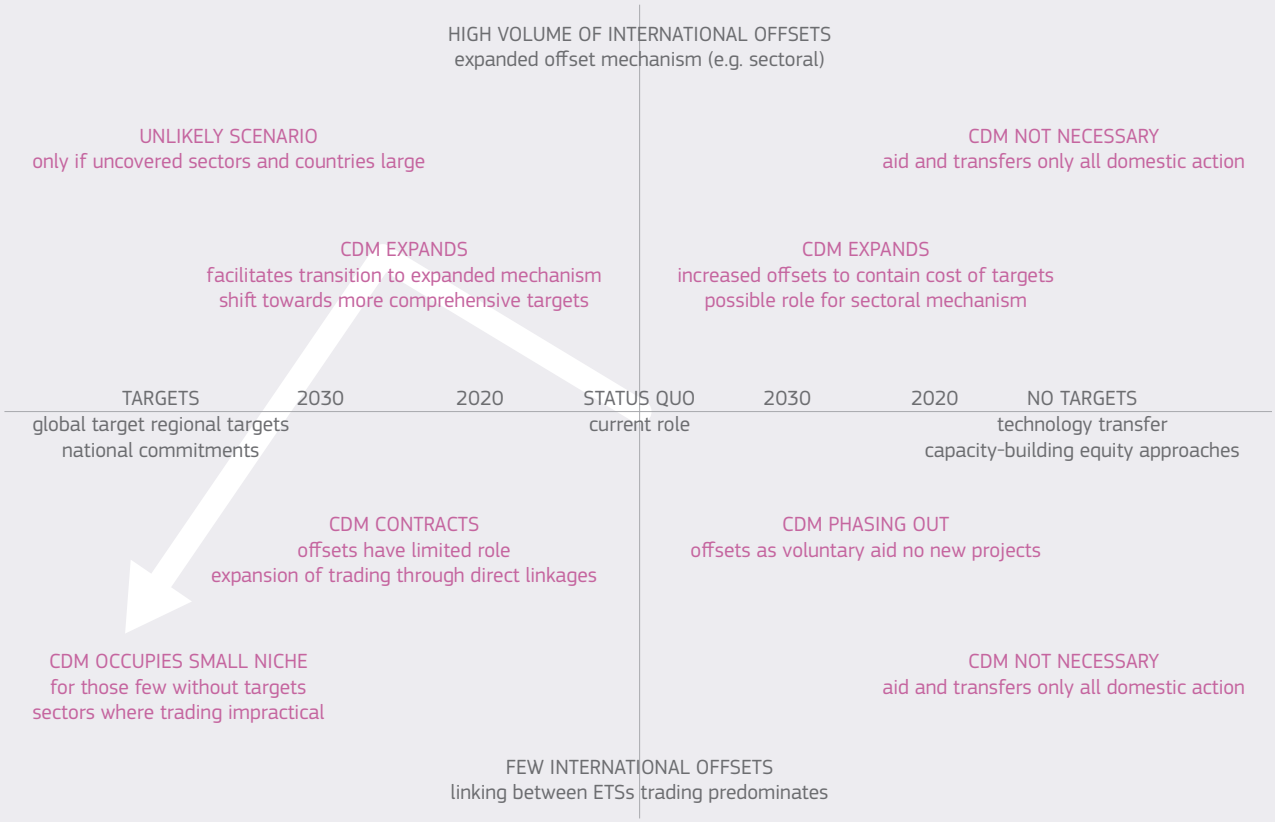
- Secondly, the transition towards a particular outcome need not be linear: the EU is advocating the development of sectoral crediting mechanisms as the path towards a global system in which there are more widespread international emission reduction targets and, following the logic above, greater use of trading. This corresponds to a situation in which climate policy moves in a north-westerly direction before moving in a west/south-westerly direction. This is depicted in figure 3.

5 For instance, both the EU and New Zealand have adopted formal binding emission reduction targets. The EU's targets are accompanied by a limitation on the use of CERs between 2008 and 2020, amounting to 50% of the overall reductions below the level of emissions in 2005 achieved under the EU ETS. By contrast, to date, New Zealand has placed no limitation on the use of offsets, although it does intend to introduce limits after 2012 (New Zealand Government, 2012).

- Thirdly, depending on the timescale of the transition to the final state of the future climate policy architecture, it may be that international climate policy sits in a temporary location partway between its start and end points for many years.

While this framework is stylised, it aims to highlight some of the key ways in which the international climate negotiations may evolve, which in turn determines some of the possible futures roles of the CDM. This is explained in more detail below.

Figure 3. The evolution of the global climate policy architecture may not be linear



Source: Vivid Economics.

Note: The timelines should be considered to be indicative only and depend upon the progress of relevant international negotiations; ETSs = emissions trading schemes.

2.2 The role of the CDM across the policy space

The role of the CDM may change over time, which could affect its optimal structure

2.2.1 Using the policy space as a framework for analysing the CDM

This section describes the possible role of the project-based CDM and a range of associated options for reforms, across different regions of the policy space, moving from the west to the east of the diagram and covering the range of options on the crediting-trading dimension.[6] It shows that, compared with alternative crediting systems, the current project-based CDM, albeit augmented through various incremental reforms and improvements, including greater use of standardised baselines, will maintain a relevant role in the short term (Classen et al., 2012). In the medium and long terms, however, most possible futures for the global climate policy architecture imply that the role of the project-based CDM will be either moderate (smaller than its current role) or negligible

6 This complements the analysis in chapter 3, which discusses in more depth the possible role of the project-based CDM under different degrees of linkage possible between different trading schemes.

(i.e. it has no future). The exceptions to this are if the status quo is maintained or there is only a moderate increase in the scope of countries with emission reduction commitments. In such cases, the CDM, suitably adjusted as a result of the ongoing reform programme, could have a similar role to what it has now or even a more prominent one.

There is no formal time dimension attached to the policy space described above, although the diagram includes some indicative time frames, which are broadly based on the timetable established in the Durban Platform, which calls for the legal instrument (or protocol or agreed outcome with legal force) to be implemented by 2020, with the added assumption that, once implemented, that outcome may take a decade to reach (UNFCCC, 2011a). However this is only indicative and the transition to the ultimate state of the global climate policy architecture may take either more or fewer years.

The analysis identified a number of possible appropriate reforms to be made to the CDM, over and above the current incremental reforms, such as standardised baselines, across the policy space. We focus, in particular, on a subset of those reforms which may transform the project-based CDM in a more fundamental manner, either by increasing or decreasing the supply of offsets in a structural way or by changing fundamental parameters of the CDM, such as host-country contributions,[7] namely:

- Introducing preferential treatment by relaxing the application of additionality tests, introducing fast-tracking or facilitating funding for capacity-building;
- Reducing the scope and volume of supply of offsets through the use of positive or negative lists (see box 2);
- Changing the ratio of emissions offset to credits issued by means of discounts, in order to address additional objectives such as host-country contribution or to differentially incentivise particular project types or host countries (see box 2);
- Increasing the scope and volume of supply of offsets through the introduction of expanded sectoral methodologies (the implication of the extensive use of sectoral mechanisms for the CDM is discussed in detail in chapter 5).

A further possible reform is, of course, that the CDM is simply abolished and not replaced by anything performing an equivalent role.

Starting from the status quo, the first level of CDM reform (e.g. preferential treatment) discriminates between the countries that have no emission reduction targets by rewarding those that adopt mitigation actions. Preferential treatment occurs when: additionality requirements for selected projects in certain countries are relaxed; the requirements of the CDM project cycle are made flexible for certain project activities in specific countries, resulting in a fast-tracking of those projects in those countries; or capacity-building programmes are facilitated in specific countries in order to reduce transaction costs. The intention of preferential treatment is to improve the conditions for investment in projects in the target countries, whether in financial terms or by lowering administrative hurdles.

The second level of reform, discounts, is triggered when we move away from the status quo. Discounts can be applied to the number of credits that can be issued or used for compliance. This type of reform requires strong political coordination to be implemented on the supply side of the market (i.e. by the body responsible for accreditation of credits) and has not yet been implemented.[8] Nonetheless, discounts are a potentially useful reform when moving towards global emission reduction targets and pure trading. This is because such stringent net emission targets require less use of offset mechanisms: the mechanisms that would have a transitional role when moving from the status quo to the ultimate scenario. Discounts can also be useful when moving towards having fewer targets, as they could be used both as a way of inducing countries with emission reduction commitments to maintain them in spite of there being no increase in the commitments made by others, and, in the worst case scenario, as a mechanism for phasing down CDM activity.

Positive and negative lists involve deeming a given project type to be automatically additional or ineligible. They can be applied either to offsets generated by different mitigation options/technologies or to offsets from different countries. In contrast to discounts and multipliers, positive and negative lists have already been used to a limited, but powerful, extent.[9] If moving in a broad south-westerly direction in the diagram, then they may be a helpful tool in limiting the role of offsets and moving towards a situation in which

7 Such reforms can be implemented either by the governing body and issuer of the certified offsets (e.g. the EB or the UNFCCC secretariat) (supply-side reforms) or by the regulatory agencies that accept those credits as valid for compliance within their domestic trading schemes (e.g. EU member States) (demand-side reforms).While the set of reforms we discuss here can be implemented either on the supply side or on the demand side, the discussion below focuses on the supply-side alternatives, as the UNFCCC and its associated bodies do not have the capacity to make many of the reforms that are possible on the demand side.

8 It is possible that such a reform could be unilaterally implemented on the demand side of the market (i.e. countries/regions choose whether or not to accept CERs for compliance purposes). This will be more effective when those countries/regions account for a greater proportion of the overall market demand.

9 On the demand side by the EU in relation to, for instance, industrial gases.

Box 2. Discounting and negative lists as reforms to control the supply of offsets

Discounting obliges users to retire more than one certificate/credit for each tonne of compliance obligation, normally under the presumption either that some fraction of the corresponding CDM project's claimed emission reductions are non-additional or because there should be some level of host-country contribution. Discounts can be applied to all or specific CDM projects. Differentiated discounting options for different project types have been proposed by Schneider (2009) and in the negotiations under the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol. It has also been proposed to introduce multiplication factors larger than one in order to further favour some project types.

A negative list takes the approach of banning the credits generated by some or all CDM projects that correspond to a specific type from being used for compliance by trading systems. Such a ban could apply to all credits generated by specific types of project or only to those from a certain category of projects (e.g. new projects, projects in countries with strong renewable energy policies, projects started after a certain date, a combination of these, etc.), or it could apply only on the basis of a project-by-project assessment against specific exclusion criteria. As an example of a demand-side implementation of a negative list, the European restriction on the use of credits from afforestation and reforestation projects, a form of negative list, has contributed to the near-absence of such credits from the market. More recently, the European restriction on the use of credits from N_2O projects has generated two reactions: an incentive to use as many of those credits as possible before they expire; and a decrease in the number of newly initiated CDM projects of that project type.

a greater proportion of countries adopt their own emission reduction targets (and subsequently trade with one another). In a similar way, they could also be helpful in reducing offset-generating activity in the event that the global climate policy architecture begins to break down. Like discounts and multipliers, positive and negative lists are clear and simple tools but, because of their stark impacts, can be challenging to agree upon at the international level. This means that positive and negative lists may be more likely to be implemented in the future as screens to limit the eligibility of units which can be imported from other schemes, rather than as a reform agreed under the auspices of the UNFCCC.

It is important to note that both discounts and multipliers and positive and negative lists involve some risks. For example, multipliers, discounts and negative lists implemented on the demand side can risk market fragmentation, with negative impacts on the efficiency of emissions trading schemes (ETSs) (see the discussion on the architecture of ETSs below). An example of this is the restrictions on CER availability imposed by the EU: this has resulted in virtually all trades of certain types of CERs, such as those from large hydro projects, occurring via over-the-counter transactions rather than via exchanges such as BlueNext. This imposes higher transaction costs and also reduces liquidity and transparency.

Finally, there are also a range of reforms that would need to be pursued if the CDM were implemented alongside a sectoral mechanism or evolved into that future sectoral mechanism. These are discussed fully in chapter 5. If the establishment of a sectoral new market mechanism (NMM) were to be pursued through an expansion of the CDM it could be supported by a pre-existing framework and would facilitate a learning-by-doing approach to introducing sectoral projects. While much of the CDM could remain unchanged, certain aspects of the mechanism would be required to evolve in order to fully accommodate the introduction of sector-wide projects, such as project boundaries, mitigation drivers, the determination of baselines and the approval of methodologies. In the case that the CDM were implemented alongside a sectoral NMM, then project boundaries and baselines would need to be integrated (see chapter 5 for a fuller discussion).

In the following subsections the above rationale is used as a basis for outlining possible reforms to the CDM across the policy space; the logic outlined above is not repeated in each of the subsections.

2.2.2 Virtually comprehensive global emission reduction targets (far west of the diagram)

A global emission reduction target implies an international global climate policy architecture whereby every country in the world adopts a well-defined and finite GHG emission budget for its entire economy as far as is practicable. As the sum of these national emission caps would represent a definite upper bound on total global emissions, the environmental effectiveness of this architecture would be the maximum possible.

In a situation in which every (or almost every) country has a target, there would be limited scope for the effective use of crediting mechanisms at the international level (see box 3). Most countries would be responsible for achieving their own target and so there would be limited incentive to either provide or buy offsets from an international crediting scheme. It is plausible that under such a scenario there would be a simultaneous increase in the level of international trading of emission rights between different countries/parties, although in theory each country could choose to meet its target in isolation.

The role of international crediting mechanisms in a world of near-universal targets would be limited:

- To sectors for which it is not technically possible to implement emissions trading (transportation and the land-use sector are two potential candidates);
- To countries for which it is absolutely not technically or politically possible to implement emissions trading (such as very poor countries or countries in which markets cannot operate effectively);
- To being a means of providing indirect linking between ETSs, in the event that direct linking is not possible (see section 3.3).

A potential exception to this would be if the use of the CDM was thought to bring additional benefits which could not be obtained from IET and domestic choices of abatement options. For example, there may be greater technology transfer or sustainable development benefits from using the CDM to generate and sell offsets which would not be obtained from using domestic policies to generate credits for IET. However, if such benefits did exist, then it would be expected that countries would prioritise those abatement options domestically. Hence, it is likely that the CDM would have a smaller role than IET if there were more comprehensive emission reduction targets.

2.2.3 Broader but not comprehensive country-level emission reduction targets (inner-west of the diagram)

Under this scenario all developed countries (e.g. Annex I countries) and some major emitters (for example, but without prejudice to the outcome of global climate negotiations, BRIC countries and other emerging economies such as South Korea) adopt a well-defined and limited GHG emission budget for their entire economy and emission allowances can be traded between governments (see box 4).

Extended emission reduction targets and greater use of offsets (inner north-west of the diagram)

In this case part of the terms under which new countries agree to adopt targets is that they are ensured access to international offsets in order to contain the costs associated with meeting those targets. Under this scenario, therefore, even though some of the countries which have traditionally generated large numbers of international offsets are no longer generating such offsets, the volume of

Box 3. The CDM under the scenario of comprehensive global and national emission reduction targets (far-west of the diagram)

The project-based CDM may continue to generate non-domestic offsets in the short to medium term and facilitate the linking of different ETSs (indirect linking), ultimately leading to the creation of a global ETS.

Time dimension for the project-based CDM:

short term	relevant future
medium term	limited future
long term	limited future, increasingly redundant

Priorities for CDM reform:

short term	preferential treatment
medium term	discounts to reduce emphasis on credit generation
long term	more stringent discounts and other restrictions on the use of credits

international offsets increases. This would plausibly necessitate the development of new sectoral mechanisms, which would supersede the current project-by-project approach of the CDM. Project-by-project crediting would then become limited to countries or sectors for which sectoral crediting is not feasible (sectoral mechanisms are discussed more fully in chapter 5).

Extended emission reduction targets and greater use of trading (inner south-west of the diagram)

Under this scenario the expansion of the number of countries adopting targets is **not** associated with increased volumes of international credits, as new countries are willing to adopt such targets without such increased volume. Instead, the costs of meeting the targets are afforded by a greater use of trading and less focus on crediting (see box 5). In this case the role of project-by-project offsets would be reduced and limited to the countries or regions that, due to their low level of development, are not considered appropriate to be subject to absolute emission caps.

Box 4. The CDM under the scenario of more countries having emission reduction targets and more use of crediting (inner north-west of the diagram)

The project-based CDM may continue to generate non-domestic offsets in the short to medium term and facilitate the development and implementation of a sectoral crediting mechanism.

Time dimension for the project-based CDM:

short term	business as usual
medium term	limited future
long term	limited future, increasingly redundant

Priorities for CDM reform:

short term	preferential treatment
medium term	discounts and reforms to be consistent with sectoral schemes
long term	positive/negative lists and other restrictions on the use of credits

Box 5. The CDM under the scenario of more countries having emission reduction targets and greater use of trading (inner south-west of the diagram)

The project-based CDM may continue to generate non-domestic offsets in the future but will have a marginal role.

Time dimension for the project-based CDM:

short term	business as usual
medium term	limited future
long term	limited future

Priorities for CDM reform:

short term	preferential treatment
medium term	discounts to reduce emphasis on credit generation
long term	more stringent discounts and other restrictions on the use of credits

2.2.4 Current architecture – the status quo (centre of the diagram)

Under this scenario most developed countries (e.g. Annex B countries) adopt a well-defined and limited GHG emission budget for some part of their economy and emission allowances can be traded between governments (see box 6). Some major emitters among developing countries take on emission reduction targets, but the rest do not adopt binding targets. There may be emissions trading within and between the countries which have adopted targets, and offsets from crediting mechanisms could be used in the countries which do not have targets.

If the status quo persists, then the short-term response is that dictated by the predicted future supply and demand dynamics over the next decade: limiting the supply of offsets. In the longer term, if the status quo continues to persist and there is no increase in the number of countries adopting emission reduction targets, then it is likely then some form of discounting may be required to improve environmental outcomes and to induce the countries with emission reduction commitments to maintain them in spite of there being no increase in the commitments made by others. If the status quo persists in the long term, then the CDM will need to scale up significantly in order to generate sufficient action in countries without commitments to avoid an unacceptable risk of dangerous climate change. Such a scenario could also necessitate an expansion of the supply of credits, in order to contain costs for the countries maintaining targets in the absence of commitments by others (i.e. a gradual trend northwards in the diagram). This increase may necessitate a greater focus on sectoral crediting with host-country contribution. A number of reforms would need to be pursued to make the CDM consistent with this scenario, as discussed more fully in chapter 5.

2.2.5 Reduction in the scope of binding emission reduction targets (inner east of the diagram)

Under this scenario a few developed countries (e.g. European countries) adopt a well-defined and limited GHG emission budget for some part of their economy and emission allowances can be traded between governments. All other countries adopt non-binding emission reduction targets. It is likely that this would be a temporary state, as the countries with formal commitments would face domestic pressure to relinquish such commitments if fewer and fewer other countries were making them.

Loose emission reduction targets and greater use of offsets (inner north-east of the diagram)

In this case there is greater use of offsets, which need not be exclusively supplied on a project-by-project basis, but a reduction in the number of countries adopting international emission reduction targets (see box 7). This would be consistent with the narrower focus on the number of countries adopting targets, leading to a greater focus on cost containment within those countries, but with there being simultaneous pressure on host countries to make contributions. In this case the role of project-by-project offsets would be reduced because of the greater use of other crediting systems.

Box 6. The CDM if the status quo persists (centre of the diagram)

The project-based CDM may continue to generate non-domestic offsets in the future.

Time dimension for the project-based CDM:

short term	business as usual, limiting supply of offsets
medium term	business as usual, with some host-country contribution
long term	business as usual, with some host-country contribution

Priorities for CDM reform:

short term	preferential treatment and institutional improvements
medium term	discounting
long term	scaling up and reforms to be consistent with sectoral schemes

Box 7. The CDM under the scenario of fewer countries having emission reduction targets and greater use of crediting (inner north-east of the diagram)

The project-based CDM may continue to generate non-domestic offsets in the short to medium term, but the greater pressure placed on cost control (or other factors) will lead to an increased desire to generate low-cost credits and hence a focus on sectoral mechanisms.

Time dimension for the project-based CDM:

short term	business as usual
medium term	limited future
long term	no future

Priorities for CDM reform:

short term	preferential treatment
medium term	reforms consistent with sectoral mechanisms and some host-country contribution
long term	positive and negative lists and further restrictions on the use of credits

Loose emission reduction targets and greater use of trading (inner south-east of the diagram)

Under this scenario the number of countries adopting emission reduction targets declines but, at the same time, there is less emphasis placed on the supply of offsets, owing potentially to a desire to enhance environmental credibility in a scenario in which fewer countries are adopting targets (see box 8). This could be achieved by discounting offsets or adopting negative lists to screen out projects in relation to which there are concerns about environmental integrity (or positive lists to focus offset-generation activity in places where there are no such concerns). In this case the role of project-by-project offsets would be reduced.

Box 8. The CDM under the scenario of fewer countries having emission reduction targets and greater use of trading (inner south-east of the diagram)

The project-based CDM may continue to generate non-domestic offsets in the short to medium term but will have a marginal role in the long term.

Time dimension for the project-based CDM:

short term	business as usual
medium term	limited future
long term	no future

Priorities for CDM reform:

short term	preferential treatment
medium term	discounts to reduce emphasis on credit generation
long term	positive and negative lists and further restrictions on the use of credits

2.2.6 Collapse of the system of international emission reduction commitments (far east of the diagram)

Under this scenario the global climate policy architecture collapses (see box 9). To the extent that there is action, it is in the form of non-binding emission reduction targets and other actions such as technology development and transfer. Under this scenario there is a limited future for all offset mechanisms, such as the CDM, as there are no commitments to be met by using offsets. Countries may make limited use of the CDM as a means of development assistance or to promote technology transfer or other domestic objectives.

Box 9. The CDM under the scenario of an eventual collapse in the international emission reduction commitment system

The project-based CDM may continue to generate non-domestic offsets in the short term but will have a marginal role thereafter.

Time dimension for the project-based CDM:

short term	business as usual
medium term	limited future, used as a transition to direct assistance
long term	no future

Priorities for CDM reform:

short term	preferential treatment
medium term	full range of restrictions on the use of credits
long term	no CDM

2.3 Conclusions

This chapter has looked at different scenarios for the future global climate policy architecture and examined what role, if any, the project-based crediting under the CDM would play under those scenarios. The chapter has discussed a range of associated options for reforms, across the policy space, moving from the west to the east of the diagram and covering the range of options on the crediting-trading dimension.

Starting from the centre of the diagram, the global climate policy architecture may evolve in different directions. Moving north from the centre corresponds to a greater use of credits to achieve emission reduction targets, which may require the relative proportion of credits from the project-based CDM to decrease and those from a sectoral crediting scheme to increase. Moving south, instead, corresponds to a decline in the use of international credits to comply with targets, with greater use of trading to ensure cost control. Finally, moving west implies a broader adoption of binding targets, whereas moving east the number of countries that adopt a well-defined and limited GHG emission budget decreases.

The analysis has identified a number of possible appropriate reforms to the CDM, over and above the current incremental reforms, across the policy space. Such policy reforms will both allow the CDM to respond to changes in the global climate policy architecture and to stimulate action in a desired direction. It has been shown, in particular, that if there is a desire to move towards a more widespread adoption of targets then discounting and/or negative lists may be appropriate policy responses. Discounting in particular would begin to remove the binary distinction between countries that have targets and those that do not, while also potentially helping to alleviate the current oversupply of offsets in the CDM market.

This chapter has shown that the project-based CDM will maintain a relevant role in the short term. In the medium and long terms, however, most possible futures for the global climate policy architecture imply that the role of the project-based CDM will either be moderate (smaller than currently) or negligible (i.e. it has no future). The only exceptions to this are if the status quo is maintained or there is only a moderate increase in the scope of countries with commitments.

3. The role of the CDM in new and emerging carbon markets

The emergence of new schemes is a key development

Chapter contents

It is desirable for CERs to be fungible in new and emerging carbon markets

The key conclusion of this chapter is that the fungibility of CERs in new and emerging carbon markets is generally desirable and should be encouraged where possible. Fungibility in more schemes will increase the demand for CERs, which will support the scaling up of activity under the CDM. So long as the CDM is seen to be achieving desirable outcomes, then this is a desirable situation. The indirect linking role of offset markets in general, and the CDM in particular, also increases the economic value that can be created from carbon markets by reducing costs. It is possible that some dynamic political considerations may call for a more limited fungibility of CERs, but there is not sufficient evidence to support any claim that such considerations override the other advantages.

"New carbon markets are on their way, and the CDM must interact with them."

3.1 Introduction

Emerging carbon markets consider linking with the CDM or using other offset mechanisms

Since the CDM was included in the Kyoto Protocol in 1997, carbon offsets sourced from non-Annex I countries have surged, establishing a global market with trade volumes that could hardly be foreseen at the end of the 20th century. The unanticipated success of the CDM led to the generation of large amounts of CERs, which were largely absorbed by the EU emissions trading scheme (EU ETS) or by sovereign purchasers.

More recently a range of new compliance markets aside from the EU ETS have either emerged or are being discussed. Australia, New Zealand and South Korea are developing their own ETSs, as well as regions in the United States and Canada, China and Brazil. Their regulators are currently in different stages of the process of designing their policies around international offsets. The regulators have generally expressed a preference for using affordable offsets with an acceptable degree of environmental integrity. However, the examples of California and Japan, which are developing their own offset standards, indicate that the CDM is not per se the first choice as the international offset standard setter.

In this regard it has been proposed that the CDM be reformed to become a global service provider, adjusting its service provision so that the requirements of the new carbon markets can be satisfied, and thus the CDM retains its position as the main global offset standard for the international carbon market.

To analyse this issue, first an overview of the current and prospective use of CERs in new carbon markets is provided in section 3.2. In section 3.3 the economic theory underlying direct and indirect linking of different ETSs is elaborated, which underpins the gains in cost-effectiveness from trading allowances. The section will make the case as to why linking ETSs is desirable in general. The issue is then placed in the specific context of the CDM: the advantages and disadvantages of allowing CERs to be fungible in new carbon markets are elucidated in section 3.4, while section 3.5 looks into future options for the governance of the CDM and suggests changes that could be made to the CDM to facilitate the greater use of CERs in new carbon markets. Section 3.6 provides conclusions.

3.2 Current and prospective use of offsets in new carbon markets

The use of CERs and other offsets in new and emerging carbon markets

3.2.1 Introduction

This section provides a factual overview of the current and prospective use of different types of offsets in new and emerging carbon markets.

To provide the context for subsequent sections, this section looks into the developments around the potential use of offsets in some of the most important new and emerging carbon markets on which information is publicly available: namely Japan, Australia, California, South Korea and China. This may inform the debate on whether and how the CDM could adapt to evolve into a global offset standard for the international carbon market. There are a number of other carbon markets, such as New Zealand's, which currently use CERs or are considering doing so, but in those markets the actual or potential volumes of CERs used are smaller than in the markets described in this section. For reasons of brevity, this section focuses on only a selection of carbon markets, but further information on other markets is available in the works cited in the section.

This section draws on a draft version of an analysis by Taenzler, Kachi and Sterk (2012), who provide an insightful overview of the relationship of the CDM with new and emerging carbon markets, as well as on some of the research commissioned by the High-Level Panel (Michaelowa, 2012a).

3.2.2 Use of offsets in Japan

Japan is actively procuring offsets from three sources, namely the mechanisms under the Kyoto Protocol, its own Bilateral Offset Credit Mechanism (BOCM) and the Ministry for the Environment's domestic carbon offsetting scheme.

Kyoto mechanisms

Japan will not be able to meet its commitment under the Kyoto Protocol without using offsets, such as CERs or those generated from joint implementation (JI) or emissions trading between countries. The Government therefore procures the credits in order to fulfil the country's commitment. In addition to the sovereign demand for offsets, Japanese private-sector parties are also purchasing offsets to meet voluntary emission reduction commitments.

Bilateral Offset Credit Mechanism

Complementing its purchase of offsets from the Kyoto mechanisms, Japan is developing its own BOCM. The Government presents the BOCM as a complement to and not a substitute for the CDM; however, in practice the design of the BOCM reflects a response to many of the criticisms of the CDM (Japanese Ministry of the Environment, 2011). While it is not possible to be certain of the underlying motivation for pursuing the BOCM, it is likely that the following reasons are relevant:

- Japan generally opposes the extension of the Kyoto Protocol and is unlikely to join the second commitment period, which will make the BOCM more important in achieving Japan's own emission reduction targets outside of the Kyoto framework, as it will not be able to use the Kyoto mechanisms.

- The Japanese economy is already highly carbon-efficient; hence, buying offsets is likely to play a larger role than in other countries in the Government's aim to reduce emissions by 25% by 2020, potentially generating pressure to procure offsets at a lower cost and in greater volumes by, for instance, facilitating a wider sectoral coverage of offsets than has been offered by the CDM to date.

- The BOCM will be geared towards promoting the export of Japanese technologies, products and services and it is envisioned to ensure a first-mover advantage for Japanese technologies by boasting a more efficient project cycle than the CDM.

Currently, 50 projects have been selected for the BOCM in various sectors, including transport, waste management, energy efficiency, renewable energy and REDD+. The Japanese Government claims that the BOCM is expected to be simpler and more flexible than the CDM, although, as yet, the methodologies for determining additionality have not been scrutinised by the UNFCCC or the COP. The administration of projects and crediting are to be conducted on a bilateral basis rather than through UNFCCC processes (Michaelowa, 2012b). The BOCM may favour energy efficiency projects, which the Japanese Government deems to be relatively disadvantaged under the CDM. Measurement, reporting and verification (MRV) standards have not yet been finalised and should emerge from the ongoing feasibility studies, which will also be used to develop standardised baselines for project types in accordance with international guidance and accounting rules (Japanese Ministry of the Environment, 2011).

Domestic offsets

The Japanese Ministry of the Environment has developed a domestic emission reduction certification system. Under the scheme, emission reductions achieved by small and medium-sized companies are certified and can then be used by larger companies for offsetting under schemes such as the Japanese Voluntary Emissions Trading Scheme (JVETS).

The role of the CDM in Japan

Japan constitutes a large potential source of demand for offsets in the future. Whether such demand is met by offsets generated under the CDM, the BOCM or other mechanisms depends on relative prices and other factors. As mentioned above, the BOCM seems to have a comparative advantage over the CDM in the eyes of the Japanese Government. Japan's main criticisms of the CDM are that (UNFCCC, 2009):

- The rules on additionality and MRV are excessively strict and complex and the CDM should be reformed accordingly;

- Nuclear power is not included, whereas according to Japan the CDM should be technology neutral;

- The sectoral distribution of projects is not optimal and, in particular, energy efficiency projects are difficult to get approved;

- The geographical distribution of projects is unequal, with vulnerable and least developed countries (LDCs) underrepresented (Japan favours differentiation in terms of,

for example, which methodologies may be used or the stringency of baselines);

- The contribution of the CDM to sustainable development has been too small; hence, projects with a high degree of co-benefits, such as reduction of air and water pollution and energy security, should get procedurally and financially preferential treatment.

Japanese scholars at the Institute for Global Environmental Strategies (IGES) have suggested that the CDM should be fundamentally reformed by shifting its approach from judging projects to checking them (Koakutsu, Okubo, Takahashi, Torii & Fukui, 2011; Mizuno et al., 2010). It is proposed that the largest barrier in the CDM is the many uncertainties around whether a project will be registered and whether it will be issues as many CERs as expected, which stems from, in their view, the unpredictable judgement of the designated operational entities (DOEs) and the EB. To solve this problem, they suggest that the CDM must move to a top-down approach to determining additionality, based on clear eligibility criteria and quantitative parameters. They further suggest that a positive list of project types which are automatically deemed additional should be established, and that for project types for which this is not possible default parameters for the investment analysis should be set. Standardised baselines should also include criteria for automatically deeming projects additional.

3.2.3 Use of offsets in Australia

Australia implemented its carbon pricing mechanism on July 1, 2012, starting with a fixed price, with the intention of changing to a flexible pricing mechanism (i.e. an ETS) in July 2015. Its offset policies comprise both the acceptance of international offsets for compliance under the carbon pricing mechanism and the development of domestic offsets under the Carbon Farming Initiative (CFI) (Commonwealth of Australia, 2011). There is some political division regarding the use of international offsets, with the Australian Greens – one of the parties in the current Government – arguing that the use of international offsets should be limited in order to spur domestic action. Hence, a limit on the use of international offsets in the Australian scheme was imposed as a result of the negotiation between various parties.

During the fixed-price period of the carbon pricing mechanism, up to 5% of emissions may be offset by domestic offsets from the CFI. The CFI bases its methodologies on methodologies developed under the CDM, but applies a top-down approach to project approval. The Australian legislation includes the provision that up to 50% of companies' liability for emission reductions can be met by international offsets from July 2015, although the projections of international offset use by the Australian Treasury assume a lower rate of use.

According to the Australian Government's Climate Change Plan, the following international units will be eligible for compliance from 2015 (Commonwealth of Australia, 2011):

- CERs other than those classed as temporary or long term and those from certain industrial gas destruction projects or large hydro products not consistent with the criteria adopted in the EU;
- Emission reduction units (ERUs) other than those from nuclear projects, certain industrial gas destruction projects or large hydro products not consistent with the criteria adopted in the EU;
- Removal units (RMUs) from land use, land-use change and forestry (LULUCF) activities;
- Other units which may be deemed eligible.

The Australian Climate Change Authority will be responsible for advising on the eligibility of units in the future. One major category of units which is not currently deemed eligible but which may become so is units used in other ETSs, such as those in the EU, New Zealand (NZ) and California. The Australian Government's Climate Change Plan states that (Commonwealth of Australia, 2011, p.108):

> *"[l]inking to other credible trading schemes, including the EU emissions trading scheme and the NZ emissions trading scheme, is in Australia's national interest".*

It is therefore likely that such linking will take place in the future, pending the agreement of the other schemes, and that additional units will become eligible for compliance, such as REDD+ units if appropriate methodologies are developed.

The potential role of the CDM in Australia

The demand for CERs in Australia from 2015 depends on the supply of offsets through the CFI and the extent to which other offsets are recognised (which may change

between now and 2015), as well as on the supply and demand conditions for allowances in Australia. An offset 'surrender charge' will be introduced to bring the price of offsets in line with the carbon price floor in the domestic ETS, of which the details are currently being discussed. In addition, the business community has called for the Australian Government to develop bilateral offset credits between Australia and other countries. Furthermore, the political opposition has called for a repeal of the carbon pricing mechanism and thus its future hinges on the political balance.

As a strong proponent of REDD+ projects, in its submissions to the UNFCCC Australia has called for the inclusion of a broad range of LULUCF activities in the CDM (Australia, 2009). Australia is also a proponent of developing NMMs on the basis of NAMAs or sectoral targets.

3.2.4 Use of offsets in California/the Western Climate Initiative

The California Air Resources Board (ARB) is the regulator in charge of California's cap-and-trade program (henceforth ETS), which will start in 2013 (ARB, 2010a). The ARB has the mandate to work with others towards linking up their ETSs. Under this mandate, the ARB focuses primarily on advancing the Western Climate Initiative (WCI) (Nichols, 2012). The members of the initiative are California, Quebec, British Colombia and Ontario; however, only California and Quebec have made progress in their efforts to implement ETSs, although British Columbia has introduced a carbon tax. A large number of Canadian provinces and US States, including Arizona, New Mexico, Oregon and Manitoba, were members of the WCI, but have since dropped out. Quebec and California are liaising on ETS-related decisions through the WCI and have agreed to recognise each other's offset credits (WCI, 2012). For the purposes of this assessment, they are treated as one source of demand for international offsets.

At the installation level, the WCI recommended that a maximum of 4% of reported emissions may be offset, which was later increased to 8% in California. California currently allows only domestic offsets generated from livestock projects, ozone-depleting substances projects, urban forest projects and US forest projects (ARB, 2010b and 2012). Offset-related policies draw on the Climate Action Reserve (CAR), an organisation that originally developed only voluntary offset credits. The ARB strengthened the CAR protocols for its own use. In future, offsets generated by REDD+ projects in Brazil and Mexico may be eligible for use in the Californian ETS.

The potential role of the CDM in California

Offsets generated by CDM projects are currently not allowed to be used in California. Provisions for international offsets are still being considered. California has adopted a 'wait and see' policy with regard to the CDM reforms before making a decision. Several reasons are cited for this (Taenzler et al., 2012). Firstly, depending on the performance of its domestic offset projects, in the early years there is likely to be no demand for additional offsets. Secondly, the ARB favours sectoral approaches to generating offsets. The ARB notes that such approaches would allow for the scaling up of emission reductions, would reduce concerns about competitiveness and would have greater environmental integrity owing to more certain additionality and a reduction in emission leakage between facilities.

The ARB has been critical of the CDM, as it allegedly failed to bring about significant policy changes in developing countries, and the ARB has concerns about the sustainability and additionality of certain project types. Whereas it initially considered allowing a limited use of CERs for a limited period of time, this provision was subsequently revised: the ARB will only consider allowing the use of CERs again once it considers that the issues detailed above have been successfully addressed (ARB, 2010c). Furthermore, Californian environmental groups such as International Rivers have been critical of the use of offsets more generally, and of CERs in particular. Some private-sector entities with an interest in high unit prices, such as providers of renewable technologies, have also spoken against the use of CERs. Other stakeholders, primarily in the private sector, have generally favoured the use of offsets but have been cautious of advocating the use of CERs owing to concerns about additionality, leakage and other limitations of project-based approaches as compared with sectoral approaches.

3.2.5 Use of offsets in South Korea

South Korea, which is a non-Annex I country, established a Presidential Committee on Green Growth, which proposed the development of a Korean ETS and is likely to coordinate its design. The proposal was approved and the ETS will launch in 2015. The use of international offsets in the ETS is foreseen.

South Korea's view of the CDM is generally favourable. It has criticised the unequal geographical and sectoral distribution of projects, but overall it considers the CDM to be a successful instrument (Republic of Korea, 2009). South Korea is one of the main CDM host countries, calculated by cumulative volume of CERs issued (over 9% of CERs issued

to date). South Korea does have concerns regarding the lack of scale of the CDM. It is therefore strongly in favour of NAMA crediting and has considered the CDM as a potential mechanism through which NAMAs could be credited, using CDM methodologies as a basis (Republic of Korea, 2008).

3.2.6 Use of offsets in China

China is currently in the process of establishing seven regional carbon trading pilots, which are planned to be launched in 2014. There is no functional carbon market in China yet, but the strong associated momentum suggests that the emergence of domestic carbon markets in China is likely. The most advanced regional carbon market is in the province of Guangdong, which has appointed authorities to govern the ETS and facilitate trade. The Chinese Government aims to establish a nationwide carbon market by 2015 (Han, Olsson, Hallding & Lunsford, 2012).

The Chinese central Government has recently published rules that will govern its future domestic carbon offset market. The rules suggest that emission reductions achieved by projects that have received approval from the Chinese Government but that are yet to be registered by the UN, as well as emission reductions achieved by projects prior to the projects' generation of credits under the UNFCCC, will be eligible as Chinese offsets. However, it appears that projects that have already earned credits under the CDM will not be allowed to produce domestic offsets, while projects registered under voluntary standards may need to start the application from scratch (Chen, 2012).

3.2.7 Conclusion

The views that emerge are that Australia, South Korea and China generally consider the CDM to be a successful instrument. By contrast, California and Japan are in favour of abandoning project-by-project additionality testing in favour of standardised top-down approaches to determining additionality. Several proposals for reform that have been made by Japan are already being implemented by the EB, but Japan feels that this is moving too slowly and that decentralised approaches would be better suited to taking local circumstances into account. The Californian regulators are also critical of the CDM, emphasising concerns about its environmental integrity. Both Japan and California claim that their own offset schemes address the particular issues that they have raised in relation to the CDM.

Nonetheless, the new and emerging offset schemes have used the CDM as a reference and are likely to continue to do so during the reform of the CDM. The experience of the CDM appears to have had an influence on the MRV requirements and eligible project methodologies under these new mechanisms. Australia's domestic offset scheme, the CFI, appears to use CDM/JI methodologies as a starting point but then does not adopt the project-by-project approval process. Instead, it uses a top-down approach based on positive and negative lists, in line with the Japanese and Californian schemes. Thus, international and domestic offset mechanisms are influenced by the CDM but differ in important ways.

3.3 Linking emissions trading schemes

Linking is desirable, according to economic theory

3.3.1 Introduction

The previous section illustrated the increasing number of existing, planned and proposed regional, national and subnational ETSs. These developments suggest that the idea of linking – allowing one scheme's allowance or other offset unit to be used, directly or indirectly, by a participant in another scheme for compliance – may be a significant element of the future global climate policy architecture. Several proposals with regard to linking are currently on the table, although existing proposals have had limited success in terms of their implementation thus far. It is possible that this may change in the future, as the greater variety of schemes and heterogeneity in the stringency of caps increases the gains from linking. In this context, this section provides a conceptual overview of the costs and benefits of different forms of linking.

The potential benefits of such linkage are primarily cost savings from increasing the scope of the market (Jaffe, Ranson & Stavins, 2009). Linking enlarges the market for allowances by connecting otherwise isolated regional ETSs. Because low-cost abatement opportunities are geographically spread over the globe, linking allows for the deployment of these opportunities and helps to promote full cost-efficiency (Anger, Brouns & Onigkeit, 2009; Edenhofer, Flachsland & Marschinski, 2007; Haites, 2009; Mehling &

Haites, 2009). In principle, linking makes allowances from the different schemes fungible, reducing price differences and facilitating price and marginal cost convergence.

However, different schemes vary in terms of design and scope and, therefore, the price of allowances can vary greatly across schemes. Whether and how price convergence takes place will depend on the characteristics of the schemes in question and the way that they are linked. Problems arise when the schemes differ in their stringency (Jaffe, 2008; Sterk & Kruger, 2009) or in their design (Gruell & Taschini, 2011). Consequently, a potential problem with the linkage of ETSs is the automatic transmission of regulatory and cost-containment features – overall cap, banking, borrowing, safety valves and price collars – from one ETS to the other. This generates concerns for some regulatory agencies because of the possible loss of control of their domestic schemes and it gives rise the possibility that ETSs would need to be harmonised in advance of any linkage.

As discussed below, the need for prior harmonisation can be avoided through the substitution of indirect links for direct ones. If two or more ETSs are linked with the same offset scheme, then these ETSs would be indirectly linked, achieving some of the benefits of cost reduction with a greatly reduced transmission of the cost-containment mechanisms from one ETS to another. This would reduce, if not eliminate, the need for prior harmonisation.

A further benefit arising from indirect linking to a common offset mechanism may be a reduction in transaction costs. Greater certainty of the price of offsets, following the realisation of demand from largely independent jurisdictions may make project development and financing easier as risk is reduced. Another reduction in transaction costs may arise from the increase in scale of the offset mechanism, which also facilitates the development of more competition and skills on the part of both project developers and the regulatory and audit infrastructure (i.e. designated national authorities (DNAs), DOEs and the EB).

The gains from linking are primarily unilateral, although indirect benefits may arise from widespread linking. Consider a case in which there are two domestic ETSs, A and B, and participants in scheme A have access to low-cost credits under the CDM. If scheme B then decided to link to the CDM, in the short run there would be an increase in the demand for offsets and prices may be expected to rise. This will raise the costs of compliance under scheme A, but will reduce them under scheme B to a greater extent than the costs have been raised in scheme A. Thus, the primary benefit of linking to the CDM is unilateral: a scheme gains access to potentially lower-cost units. However, in the long run the increased demand for units and efficiency gains of scheme B may spur the development of low-carbon technology, which ultimately could be used by scheme A.

The CDM is an example of an offset scheme that may be used to achieve indirect linking, although it could equally be a sectoral crediting mechanism or other type of scheme within the NMM architecture. This is important as, in the scenarios in which the CDM has a useful role to play in promoting indirect linking, the same benefits could also be derived through, say, a sectoral crediting mechanism. In that case other features of difference between the two – such as the relative role of the private sector versus government action – would inform the choice between them.

3.3.2 Different systems of linking

Figure 2 represents possible future climate policy architectures, ranging from a situation in which just a handful of developed countries adopt binding emission reduction targets to a situation in which every major emitter (e.g.

Box 10. The linking of mitigation schemes: key points

Linking is advisable because it reduces the overall cost of achieving a given emission reduction target. In particular, linking lowers the aggregate cost of emission reductions by allowing regulated entities in high-cost schemes to pay for less-expensive abatement opportunities in lower-cost schemes.

The benefit of enhanced cost-effectiveness comes, however, at the cost of contagion: unrestricted direct linking exposes a domestic scheme to the design features and market developments of any scheme to which it is linked. To avoid these problems would require different domestic schemes to move towards a common design in terms of, for instance, price caps and floors, borrowing and banking provisions. The challenge of obtaining regulatory alignment on these issues might constitute a decisive disadvantage in comparison with indirect linking, whereby two or more trading systems are linked with the same offset scheme.

developed and developing countries) adopts a well-defined and limited GHG emission budget for its entire economy.

However, for each of the scenarios there are a range of possible options for the extent to which different national or regional ETSs may be linked. The following four different scenarios, which differ in terms of the degree of linkage between different regional or national schemes, are compared below:

- A completely integrated international system in which there is a single global ETS with no barriers to the transfer of units between sectors or countries;
- A system of formal links in which different schemes formally recognise each other's allowances and accept units issued by other schemes for compliance purposes, potentially with quantitative limits;
- A system of indirect links in which there is no formal recognition of others' allowances, but there are overlapping means of compliance, which results in partial relationships between different schemes, such as between the NZ ETS and the EU ETS in that both accept certain types of CERs for compliance;
- A fragmented set of schemes which do not have any intentional linkages between them and operate independently, such as the EU ETS and the Australian carbon pricing mechanism in its early years.

The comparison of these scenarios is made with respect to their cost-effectiveness, environmental effectiveness and their chance of being successfully implemented (political feasibility). We also distinguish between unilateral and bilateral links, as discussed in box 11.

A global trading scheme

A global trading scheme architecture implies that every country in the world adopts a well-defined and finite GHG emission budget for its entire economy. Clearly, as the sum of these national or regional emission caps would represent a definite upper bound on the total global emissions, the environmental effectiveness of this architecture would be the maximum achievable. Also, a global trading scheme can achieve the maximum cost-effectiveness, because a single price for emissions is established across all sectors and regions in the world. Integrated coverage of all world regions and sectors maximises the gains from trading, as emissions are reduced in places where this can be achieved at the lowest possible cost.

However, it is clear that the political feasibility of this scenario is severely limited at present.

Direct linking

Direct, or formal, linking occurs whenever two or more independent national or regional trading systems mutually

Box 11. Unilateral and bilateral links

The linkage between two schemes may be either unilateral, where allowances can be transferred in only one direction, or bilateral, where allowances may flow in either direction.

In the case of unilateral linkage, if the allowed direction of transfer is from the higher-price scheme to the lower-price scheme, no transfer will take place: buyers in the second scheme already have access to low-price allowances and these are not valid in the higher-price system. But if transfer is allowed from the lower-price to the higher-price market, allowances will flow from low- to high-price regimes as buyers in the higher-price scheme take advantage of the new supply of cheap credits. This flow could potentially continue until all the allowances in the lower-price market have been used up. However, the transfer of allowances represents a decrease in supply in one scheme and an increase in the other, leading to a corresponding increase in the price of allowances in the lower-price scheme and a decrease in price in the higher-price scheme. Consequently, the difference between the two prices will start to decrease until either the prices reach the same level or all the available allowances have passed from one scheme to the other.

There will be a similar dynamic in the case of bilateral linkage unless restrictions, like discretionary quantity-control systems, are imposed. In the presence of trade restrictions, a difference in the price of allowances between the two schemes will cause prices to move towards each other until the point at which the maximum allowable number of allowances has been transferred. If this occurs before the two prices converge, the result will be two differently-priced schemes with no flow of allowances between them. This is very similar to the above situation with a unilateral linkage except that with a bilateral linkage the flow could resume in the opposite direction if market conditions change.

recognise each other's allowances (i.e. they accept emission allowances issued in other schemes or fungible offsets as valid for compliance within their own scheme). A formal linking architecture is thus established through a concerted (unilateral or bilateral) decision to form a linkage. An ultimate consequence of linking is the equalisation of marginal abatement costs and, consequently, the formation of a common price of allowances. This results in a reduction in the cost of achieving a given emission reduction target. This benefit, and full price convergence, can, however, only be guaranteed in the presence of unconstrained bilateral linking.

The benefit of enhanced cost-effectiveness comes at the cost of contagion: once two trading systems are linked, changes in the design or regulatory features of one scheme also influence the price formation in the other scheme. For instance, if the regulatory agency of one trading scheme decides to adopt a price ceiling, then the entire linked scheme is in effect subject to the same price cap. Thus, there is a partial loss of control on the part of the domestic regulatory agency over their own scheme, necessitating a high degree of coordination in the management of the joint trading schemes. Relevant design issues with implications for the whole linked system include the setting and modification of emission caps; price ceilings and price floors; banking and borrowing provisions; and penalties and enforcement of compliance.

To address these issues, institutional provisions in the form of linking agreements and joint regulatory bodies are required, both before and during the linking operation (Edenhofer et al., 2007). In fact, several regulatory agencies of existing and proposed trading schemes are in advanced discussions on exploring bilateral linking over the medium term, as discussed in box 12.

Nevertheless, even if direct (bilateral or multilateral) linking is advisable, there is little evidence to suggest that it will definitely emerge. For instance, while the functional design features of the WCI and the Regional Greenhouse Gas Initiative (RGGI) are generally compatible, RGGI's allowance prices are so low that direct linking is hardly attractive for either side: the RGGI does not wish to import the high allowance prices of the WCI, while the WCI does not wish to import the weaker emission reduction targets of the RGGI. This corresponds to a situation in which the regulatory agency that regulates a scheme with a relatively high domestic allowance price would be reluctant to link its trading scheme to that of another country or region characterised by a relatively low allowance price, in as much as that would entail massive imports of non-domestic allowances.

A more general point is that there is often great debate about the design features of a scheme and, once features are decided upon, there is often little remaining political capital to motivate linking.

Indirect linking

A system of indirect links is where there is no formal recognition of others' allowances, but there are overlapping means of compliance, which results in partial relationships between different schemes. An example is between the NZ ETS and the EU ETS, which both accept certain types of CERs for compliance. In theory, a system of indirect links could mimic formal linking if there is sufficient flexibility in the volumes and types of units that are fungible between schemes. In practice, the imposition of qualitative and quantitative limits on which offsets are allowed, as well as (potentially) the availability of low-cost offsets, is likely to mean that links between the markets, and the gains from linking, are less than in cases in which a 'pure' form of direct linking is pursued.

The economic benefits of using offsets from developing countries with relatively low abatement costs are presented in figure 4. Total emission reductions are presented on the x-axis, within the range of 0 to 1. The figure might represent an explicit international agreement with legally binding or voluntary emission reduction targets, or the scenario of a collection of activities, in which, for example, developed countries have legally binding or voluntary emission reduction targets and finance some mitigation actions in developing countries.

The price paid per unit of emission reductions is presented on the left-hand y-axis for offset buyers and on the right-hand y-axis for offset sellers. Marginal abatement cost (MAC) curves are presented for sellers and buyers. These are upward sloping, as the incremental costs of emission reductions are increasing with the quantity of emission reductions. Offset-buyer countries face higher costs of emission reductions than offset sellers.

Box 12. What is known about direct linking between schemes?

Even in economies and political systems that are otherwise closely linked, few direct links between mitigation schemes have been agreed, despite most regulators acknowledging that direct links are desirable.

In an effort to improve its voluntary domestic scheme, the Swiss Government planned to link its carbon market to the EU ETS on January 1, 2013, but lengthy reform procedures made the time scheduled unfeasible and this has now been delayed until 2014.

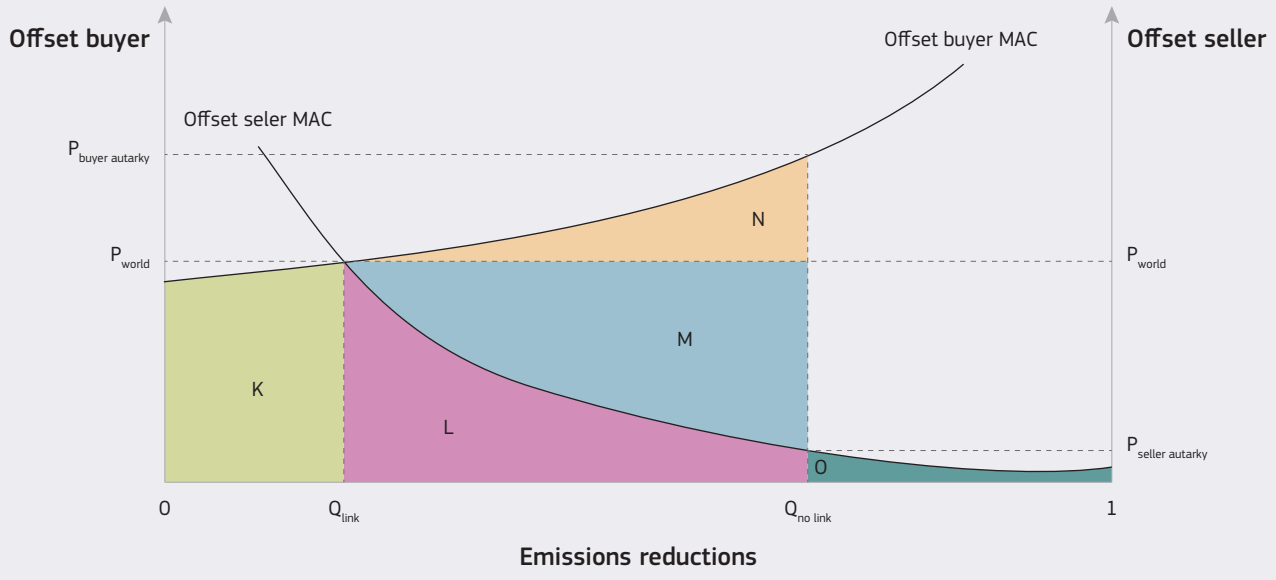
California and Quebec engaged with each other closely during the development of their schemes through their membership of the WCI (see section 3.2.4), which was intended to encourage early links between the schemes in each of the members' jurisdictions. Indeed, California has announced its intention to link its cap-and-trade program to a similar scheme in the Canadian Province of Quebec, forming a joint market to reduce GHG emissions. The draft regulation calls for the mutual acceptance of compliance instruments, like allowances and offset credits, by the two jurisdictions and for a common registry and auction. It is recognised by California that, in expanding the size of the carbon market, linking with Quebec would also provide increased liquidity to the carbon market and lay the groundwork for new partners to join its programme (Climate Policy News, 2012). As yet, there is no link between the two schemes and implementation is lagging behind previously announced timetables. There is uncertainty as to what impact linking the cap-and-trade mechanisms will have on allowance prices.

At a more embryonic stage, Australia and the EU have confirmed their mutual commitment to working towards linking the Australian and European ETSs. Their discussions will move forward at the "Australia-Europe Senior Officials Talks on Climate Change" forum. However, a timetable for such direct linking does not appear to be publically available [1] (European Commission and Australia, 2012).

An exception to the challenge of linking ETSs has been the linking of the EU ETS with the schemes of Norway, Iceland and Liechtenstein. Originally Norway's ETS was initiated as a stand-alone scheme but it has now been fully integrated into the EU ETS. This was a result of the extension of the EU ETS to include Iceland, Liechtenstein and Norway in 2007 (European Commission, 2007).

1 Following the completion of this report the Australian government announced a unilateral link to the EU ETS, whereby EUAs will be accepted for compliance in the Australian scheme from 2015.

Figure 4. The hypothetical gains from linking an ETS to an offset mechanism are large



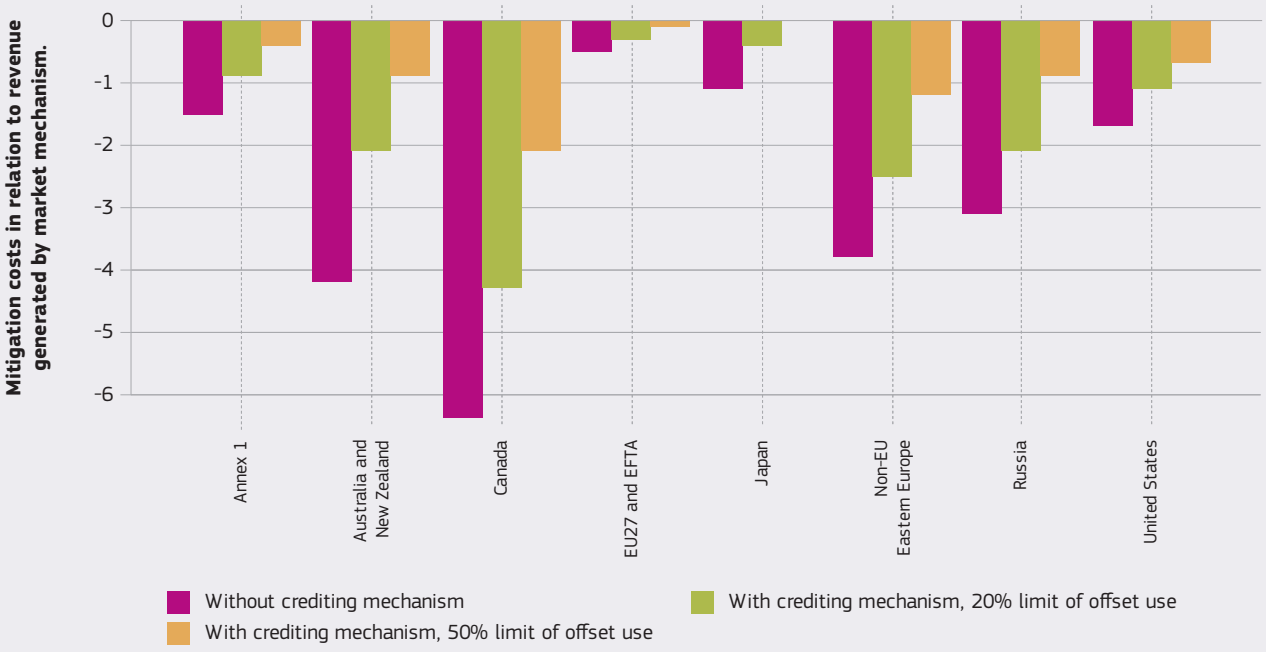
Source: Vivid Economics' analysis.

If the offset buyer intended to reduce emissions up to $Q_{no\ link}$ and was not be able to link to the offset mechanism, the price per unit of emission reductions would be $P_{buyer\ autarky}$. The offset seller may reduce some emissions through domestic policies or multilateral grants of the amount 1- $Q_{no\ link}$, for which it pays $P_{seller\ autarky}$. Total costs would be the areas K+L+M+N for the offset buyer and 0 for the offset seller.

When the offset buyer can buy offsets from the offset seller (i.e. a link is established), the low-cost abatement options of the offset seller can be accessed by the offset buyer. In this case, emission reductions achieved by the offset buyer amount to up to Q_{link} and those achieved by the offset seller to 1-Q_{link}. The market equilibrium is found where the MAC curves intersect, at P_{world}. The offset buyer now pays K+L and the seller still pays 0. The economic gains are M for the seller country and N for the buyer.

Therefore, an emissions trading architecture with indirect linkages between regional ETSs will be more cost-effective than the scenario of fragmented ETSs. The Organisation for Economic Co-operation and Development has developed a global computable general equilibrium model that shows the potential cost reductions for different regions in the world that can be achieved by such indirect linking (Dellink, Jamet, Chateau & Duval, 2010). The results are shown in figure 5 for 2020. The cost reductions are shown for the cases in which there are no limits to using offsets, there is a 20% limit and there is a 50% limit.

Figure 5. The income savings on mitigation costs in Annex I countries associated with allowing access to a well-functioning crediting mechanism could reach 1 percentage point by 2020 compared with a situation in which there is no access to a crediting mechanism



Source: Dellink et al. (2010).

The model suggests that the potential cost reductions are substantial for all regions in the world. Compared with a baseline projection of income, taking mitigation action would imply a 1.5% reduction in income for Annex I countries. When access to a well-functioning crediting mechanism is allowed (e.g. a reformed CDM), with a 50% limit on offset use, mitigation costs would amount to a 0.4% reduction in income. A 20% limit on offset use would lead to a 0.9% reduction in income. The figure shows that the greatest cost savings are possible in the economies with the highest marginal abatement costs and/or those that are the most carbon-intensive. It should be noted that this is a model that assumes that there are no market imperfections and policy distortions, which is unrealistic. Nonetheless, the numbers give an indication of the gains that can potentially be realised.

A greater use of indirect linking mechanisms may also create dynamic cost-effectiveness benefits for the existing users of those mechanisms by helping to reduce the transactions

costs. More specifically, the greater demand for offsets created by the expanded use of a mechanism is likely to reduce the risk faced by project developers, easing their acquisition of finance, while also putting pressure on the regulatory mechanisms to operate as efficiently as possible. This dynamic can arguably be seen in the CDM at present, where an increase in the number of projects entering the CDM project cycle has been associated with a decline in the time taken to process applications (Michaelowa, 2012a and 2012b).

Turning from cost-effectiveness to environmental effectiveness, the impact of linking on the environmental effectiveness of each scheme depends on the extent of the trading systems across regions, the covered sectors and the specific design features of the offset schemes. In theory, the architecture of indirect links can affect a larger share of global emissions than fragmented markets, since the combined demand from different trading schemes increases the scope for a larger-scale implementation of offset schemes. Therefore, an emissions trading architecture with indirect linkages between regional trading systems will be more cost-effective than the scenario of fragmented trading scheme case. By how much depends on the level of abatement costs and the price convergence across schemes, which depends on the offset supply curve (i.e. the extent to which it is possible to use offsets in the indirectly linked schemes). Nevertheless, on the whole, one can expect the environmental effectiveness of schemes which are indirectly linked to be lower than that of schemes in an architecture of direct links.

Fragmented trading systems

A fragmented trading system occurs when two or more independent national or regional trading systems do not have any intentional linkages between them. This is the case, for instance, as of July 2012, for the EU ETS and the Australian carbon pricing mechanism. Since the schemes operate independently, fragmented markets cannot ensure the equalisation of marginal abatement costs and allowance prices. Consequently, compared with a consolidated global market (more on this below), fragmented markets cannot guarantee a fully cost-effective solution.

3.3.3 Conclusions on linking

The increasing number of existing, planned and proposed regional, national and subnational trading systems suggests that the linkage of these schemes may be a significant element in the future global climate policy architecture. In this context, linkage refers to the recognition of the allowances from one scheme for use in meeting the compliance requirements of another. The potential benefits of such linkage are primarily the cost savings from increasing the scope of the market (Jaffe et al., 2009).

Trading systems could be linked directly, either unilaterally or bilaterally. With a direct bilateral linkage, a pair of domestic emissions reduction policies would recognise each other's allowances. Under unilateral linkage, one scheme recognises the allowances of the other scheme, but the recognition is not reciprocal. Allowance prices would converge with both direct bilateral linkage, as long as there were no constraints on interscheme trades, and unilateral linkage, as long as the buying scheme's price was higher than the selling scheme's price; no trading would take place if the opposite were true (Jaffe et al., 2009).

A potential problem with this approach is that direct linkage of trading systems will lead to the automatic transmission of cost-containment elements – banking, borrowing, safety valves and price collars – from one trading system to the other. This raises concerns for some countries because of the possible loss of control of their domestic schemes, and it gives rise to the possibility that schemes would need to be harmonised in advance of any linkage. These barriers are reflected in the lack of direct links observed between existing schemes. Such transmission can also occur through indirect linking, but it is limited to some degree depending on the qualitative and quantitative restrictions on the use of offsets in the schemes in question.

The need for prior harmonisation can be avoided through the substitution of indirect links for direct ones. If two or more trading systems were linked with the same offset scheme, then these two or more schemes would be indirectly linked, achieving the benefits of cost reduction with a greatly reduced transmission of cost-containment mechanisms from one system to another. This would reduce, if not eliminate, the need for prior harmonisation.

Table 1 presents a summary of these considerations, with a tentative scoring of the performance of the different trading regimes with regard to the criteria of environmental effectiveness, cost-effectiveness and political feasibility. It can be seen from the table that a global trading scheme would be favourable in terms of environmental effectiveness and cost-effectiveness. Formal linking would perform less well in terms of both cost- and environmental effectiveness, but is still good. Formal linking is slightly less politically feasible than indirect linking, as in the case of the latter there is little need for harmonisation, although the performance of indirect linking with regard to the effectiveness criteria would be worse than that of formal linking. Fragmented trading, as is the status quo, receives low scores for the effectiveness criteria, but it is politically the most feasible of all the options.

Table 1. The performance of different types of linking, scored against some important criteria

Criterion	Fragmented trading	Formal linking	Indirect linking	Global trading scheme
Environmental effectiveness	2	4	3–4	5
Cost-effectiveness	2	4	3–4	5
Political feasibility	5	3	4	1

Source: Vivid Economics' analysis.

Note: 1 = very poor; 2 = poor; 3 = average; 4 = good; 5 = very good.

3.4 Assessment of the fungibility of CERs in new carbon markets

The impact of the fungibility of CERs can be compared with the objectives of the CDM

3.4.1 Introduction

This section analyses the issue of whether CERs should be made fungible in new carbon markets. It builds on the sections above, which provided, in turn, a factual assessment of the current plans regarding the fungibility of CERs in new markets and the broad economic case for linking carbon markets, either directly or indirectly. This section uses the conceptual findings from the previous section, but provides a more practical perspective:

- It asks, in particular, whether CERs – and making them fungible in new and emerging markets – are a good tool for providing indirect linkages between carbon markets.
- It recognises that the CDM itself has a particular set of objectives, as defined in international agreements and indicated in submissions to international negotiations, and so explicitly focuses on whether such fungibility will promote the stated objectives (which link to, but are somewhat different from, the theoretical criteria used above).

As such, the analysis looks at the advantages and disadvantages of allowing new carbon markets to use the CDM as the common standard-setter for their offsets.

The section begins by presenting a methodological framework, starting with a review of the three fundamental objectives set for the CDM under the Kyoto Protocol and the Convention, in section 3.4.2. Allowing the use of CERs and three alternative scenarios for offsetting in new carbon markets are assessed against those objectives in sections 3.4.3, 3.4.4 and 3.4.5. Section 3.4.6 provides conclusions.

This analysis, and in particular the assessment of the CDM against alternative (international) offset mechanisms, draws on the analysis presented by Michaelowa (2012).

3.4.2 Methodological framework

In order to analyse whether it is desirable to make CERs fungible in new carbon markets, a methodological framework has to be designed that can capture the multiple issues that arise. This consists first of identifying the current and potential key future objectives of the CDM, and then of identifying the alternative scenarios to allowing the use of CERs in new and emerging carbon markets. In order to frame this analysis in a practical manner, we identify key questions that need to be addressed in order to assess the scenarios against each of the objectives.

The three objectives of the CDM

The CDM was established by the Kyoto Protocol in 1997. The objectives of the CDM are stipulated in Article 12 of the Kyoto Protocol, which also states that the CDM should contribute to the ultimate objective of the Convention.

The first objective of the CDM can be interpreted as **harnessing cost-effective emission reductions for Annex I countries**. To achieve this, a number of requirements have to be met:

- Emissions reductions as a result of CDM projects have to be additional to emission reductions that would have happened anyway, as otherwise there would be

no "real, measurable and long-term" reductions (Kyoto Protocol, 1997);

- Low-cost emission reductions have to be effectively identified and used;
- Transaction costs have to be minimised;
- Governance has to be effective.

The second objective of the CDM can be interpreted as **promoting sustainable development in CDM host countries**, which can be achieved by:

- Building capacity for realising sustainable development benefits;
- Generating investment or other financial flows;
- Driving transfers of technology;
- Other means of stimulating sustainable development.

These objectives are broadly in line with those stated in the submissions to the UNFCCC negotiations related to the NMM and the Framework for Various Approaches.

A third objective has been raised in the submissions related to market-based mechanisms, which is not in the Kyoto Protocol: **supporting new action by a range of countries leading to global abatement**. This requires mitigation policy to be incentivised in various ways in countries which do not currently have emission reduction commitments under the Kyoto Protocol. In order to allow for the future evolution of the objectives agreed by the COP under the UNFCCC, this third objective is also considered in this research. It is a matter for Parties to decide whether this additional objective should be formally considered and the extent to which considerations under this third objective should influence decision-making upon the nature of the agreed objectives.

Alternatives to the use of the CDM in new carbon markets

An assessment of the merits of allowing CERs to be fungible in new carbon markets should be comparative, assessing the relative merits of the fungibility of CERs compared with alternative scenarios. For the purpose of this analysis, three stylised alternative scenarios have been identified that are loosely based on various kinds of existing practice, resulting in four scenarios in total.

1. CERs are allowed in the new carbon market

The first scenario describes a situation in which the new carbon market makes use of the CDM for sourcing offsets that market participants can surrender for compliance. As a result, global demand for CERs increases. It is assumed that the process of reforming the CDM processes and methodologies will continue, with limited scope for methodologies with a sectoral focus. This is the base scenario that is compared with scenarios 2 to 4.

2. No offsets are allowed in the new carbon market

Under this scenario the new carbon market does not allow any offsets. An example of this is the US SO_2 cap-and-trade scheme that existed from 1995 to 2011, in which all emission reductions had to be made by installations covered by the scheme. There are no examples of ETSs that do not allow offsets or intend not to allow them, although some activist groups would like to see such schemes prohibit the use of offsets to stimulate domestic abatement.

3. Predominantly domestic offsets are allowed in the new carbon market

This scenario relates to a situation in which the predominant source of offsets is a domestic offset mechanism operated in the country in which the new carbon market is implemented. For example, California has thus far focused on developing methodologies for domestic offset projects, although there are also some methodologies for offset projects in Mexico and Brazil. Initial information from China indicates that its regional ETSs are likely to absorb domestic offsets in the first instance (see section 3.2.6). Furthermore, in the early years of the Australian ETS only offsets from the domestic CFI are allowed (section 3.2.3).

4. Other international offsets are allowed in the new carbon market (not CERs)

Under this scenario a new carbon market creates its own standard for international offsets, reducing or removing the demand for CERs in that country. There is no paradigmatic example of this. Japan's BOCM (see section 3.2.2) may replace the need for CERs in the event that it can be scaled up sufficiently, although Japan currently envisions the BOCM to exist alongside the CDM. Apart from the generation of credits following a project-by-project approach, both the Californian scheme and the BOCM envision the creation of sectoral credits, while the EU also favours the fact that the NMM will lead to the generation of sectoral credits (see chapter 5).

Key questions for each CDM objective

The use of CERs or any of the alternatives in new carbon markets affects the likelihood of achieving the objectives of the CDM in various ways. To frame the analysis of these effects, it is necessary to first identify the key questions related to each objective, incorporating both static and dynamic impacts. These are outlined in table 2 and elaborated below.

Table 2. Key questions related to the three objectives of the CDM have been identified in order to frame the analysis of whether it is desirable to make CERs fungible in new carbon markets

Criterion	Global trading scheme
1. To harness cost-effective emission reductions for Annex I countries, requiring additionality of emission reductions, minimisation of transaction costs and effective governance	a. Is the environmental integrity of the CDM greater or less than alternative?
	b. Will emission reductions be able to be achieved at a lower cost than otherwise?
	c. Are the transaction costs of acquiring CERs higher or lower than the costs of acquiring offsets from other sources?
	d. Is one market for offsets preferable as a means to improve market functioning by reducing price volatility?
2. To promote sustainable development through capacity-building, investment or other financial flows, technology transfer or through other methods	a. Does allowing the fungibility of CERs promote capacity-building for sustainable development more than other offset mechanisms?
	b. Does allowing the fungibility of CERs promote the transfer of finance for sustainable development more than other offset mechanisms?
	c. Does allowing the fungibility of CERs promote the transfer of technology for sustainable development more than other offset mechanisms?
3. To support new action by a range of countries leading to global abatement, including incentivising mitigation policy in CDM host countries	a. Is there any evidence that allowing the fungibility of CERs is associated with more ambitious policies?
	b. Does the added momentum provided to the CDM by new CER buyers preclude other non-Annex I countries from taking action?
	c. Does the added momentum provided to the CDM by new CER buyers lead to the faster implementation of ETSs in non-Annex I countries?

Source: Vivid Economics' analysis.

3.4.3 Assessment against CDM objective 1: to harness cost-effective emission reductions for Annex I countries

In this section the merits of allowing CERs to be fungible in new carbon markets compared with the alternative scenarios is assessed against objective 1 of the CDM, namely to harness cost-effective emission reductions for Annex I countries, requiring additionality of emission reductions, minimisation of transaction costs and effective governance. An overview of the assessment presented in this section is presented in table 3.

Table 3. Allowing the use of CERs in new carbon markets may lead to more cost-effective emission reductions

Key question/ alternative scenario	No offsets allowed	Predominantly domestic offsets allowed	Other international offsets allowed, not CERs
Is the environmental integrity of the CDM greater or less than alternative?	Allowing the use of CERs may lead to an increase in GHG emissions if not all CERs are additional	Allowing the use of CERs may lead to an increase (decrease) in GHG emissions if a greater (lesser) proportion of domestic offsets are additional compared with CERs	Allowing the use of CERs may lead to an increase (decrease) in GHG emissions if a greater (lesser) proportion of domestic offsets are additional compared with CERs
Will emission reductions be able to be achieved at a lower cost than otherwise?	Allowing the use of CERs cannot increase the costs of emission reductions, but it is likely to substantially decrease them		Depends on costs of alternative international offsets compared with CERs
Are the transaction costs of acquiring CERs higher or lower than the costs of acquiring offsets from other sources?	N/A	Acquiring CERs may be more costly than acquiring domestic offsets	Acquiring CERs may be more costly than acquiring international offsets
Is one market for offsets preferable as a means to improve market functioning by reducing price volatility?	The more integrated a carbon market is, the less volatile carbon prices should be		

Source: Vivid Economics' analysis.

Is the environmental integrity of the CDM greater or less than the alternative?

The environmental integrity of the CDM may differ from that of other mechanisms, affecting the relative desirability of the alternatives when taking the CDM's objective of harnessing cost-effective emission reductions into account.

In the event that the new carbon market would not otherwise allow any offsets, allowing it to use CERs may lead to an increase in emissions, owing to the alleged non-additionality of some CERs (Spalding-Fecher et al., 2012).

In the case that domestic or other international offsets would otherwise be used, allowing the use of CERs may lead to an increase or decrease in emissions depending on the relative environmental integrity of the alternative. Safeguarding the environmental integrity of the CDM has been a challenge, especially regarding the additionality of emission reductions (Spalding-Fecher et al., 2012). However, other offset mechanisms have not yet proven to be superior and may face similar or worse issues around environmental integrity in the future. For instance, California may allow credits generated by REDD+ projects to be surrendered under its ETS, despite perceived issues around the permanence of the emission reductions achieved by REDD+ projects.

However, the use of standardised baselines and positive lists to determine additionality under the Californian and Japanese schemes is claimed to explicitly address the additionality-related issues that are experienced under the CDM. Japan in particular is taking a firm position, stating that the CDM rules on additionality have been counterproductive and should be reformed (Taenzler et al., 2012), favouring positive lists and performance benchmarks itself. The Californian CAR in practice often uses a positive list of projects that are automatically deemed additional when certain criteria are met, frequently deploying a penetration threshold. The Australian CFI also uses a positive list for determining additionality (Michaelowa, 2012b). However, despite these approaches, it is not yet clear whether these will necessarily prove any more effective at determining additionality than the approach adopted to date under the CDM (Spalding-Fecher et al., 2012).

Under the CDM, an elaborate set of more than 200 baseline methodologies has been approved. In recent years these have been increasingly standardised, which culminated in principles for standardised baselines in 2011. Also, the methodologies increasingly include default parameters in order to avoid complicated data gathering. BOCM baseline methodologies have not yet been specified, but are likely to include highly standardised procedures. Some of the methodologies detailed in the BOCM's feasibility studies have been simplified CDM methodologies, while others

show a more innovative approach to determining baselines. The CAR applies baseline methodologies using a top-down procedure which is to be standardised, ideally using benchmarks. The Australian CFI uses project-based methodologies that are developed by means of a bottom-up procedure (Michaelowa, 2012b).

One of the potential benefits of a sectoral approach to crediting is that it might avoid intrasectoral leakage (i.e. the replacement of the emissions from one installation within a sector by the emissions from another) (see chapter 5).

On balance, it may be that the CDM performs better in terms of environmental integrity than the alternatives, due to its established rulebook and institutional capacity, its history of scrutinising methodologies and projects based on environmental integrity and its recent reforms, including a broad move towards standardised baselines. However, over time emerging mechanisms such as those in California and Japan may become successful at deploying other approaches to ensuring environmental integrity, after an initial phase of learning from their mistakes and thorough evaluations of their policies.

Will emission reductions be able to be achieved at a lower cost than otherwise?

Section 3.3 showed that, in general terms, indirect linking of ETSs and the use of international offsets will allow emission reduction to be achieved at a lower cost than in a situation in which no offsets are available.

It also follows from this analysis that a common, mature and deep market for offsets such as the CDM may be able to generate the cheapest emission reductions for new carbon markets and achieve the greatest environmental effectiveness (see section 3.3), in spite of concerns that the CDM has missed some low-cost emission reduction opportunities and some project types do not perform as expected (Michaelowa, 2012b). Domestic offset mechanisms by definition have a lower degree of geographical distribution and are likely to be confined to those geographies with generally more-expensive abatement options. Further, alternative international emerging offset mechanisms have not yet established a similar degree of global market penetration with an extensive global network of knowledgeable project developers to the CDM.

Sectoral crediting mechanisms could be scaled up substantially and provide cost-effective abatement options. However, as discussed in chapter 5, a key challenge facing sectoral crediting approaches is that it is not automatically clear how firm-level action and different approaches may vary in effectiveness. In addition, sectoral crediting is only possible in a limited number of sectors and as such rules out some locations with potentially cheap abatement options.

In summary, the broader and deeper the 'pool' of offsets which market participants can access, the more cost-effective abatement activity is likely to be. This supports the use of the CDM, given its broad geographical and sectoral coverage, although sectoral crediting could also deliver similar or greater benefits in this regard so long as the underlying design issues are addressed.

Are the transaction costs of acquiring CERs higher or lower than the costs of acquiring offsets from other sources?

The transaction costs of acquiring CERs in the broadest sense, relating to the administrative burden of the parties involved and the governance arrangements, are deemed to be high. The administrative costs are significant, with fees charged by DOEs for validation and verification and fees charged by the UNFCCC for project registration and CER issuance, as can be seen in table 4. It is unknown how these costs compare to those of the Japanese BOCM. The Californian CAR charges project fees of $500 and an issuance fee of $0.20 per unit, while verification costs are in the range of $10,000.

As for governance, the bureaucratic processes of the UNFCCC secretariat and the EB have been criticised, although these have been made more streamlined and project cycle times have decreased in recent years (Spalding-Fecher et al., 2012; Classen et al., 2012). In 2008 and 2009, the time from the start of the validation up to the registration of CDM projects regularly peaked at nearly 800 days, which has decreased since and by the end of 2011 was brought back to 200 days. The project cycle was shortened by increasing the number of CDM staff at the UNFCCC secretariat, simplifying review procedures and establishing a clear hierarchy of rules. In 2011 a major regulatory overhaul resulted in a unified validation and verification standard, as well as the integration of the many scattered decisions of the EB into the regulatory documentation. Nonetheless, issues around rule interpretation remain a concern, especially regarding methodologies for determining baselines and monitoring (Michaelowa, 2012b).

The problem of high transaction costs is also acknowledged by the regulators of new carbon markets. The aim of new mechanisms is therefore to make use of less-convoluted processes by using methods such as standardised baselines which allow for a less onerous process of testing for

additionality (Spalding-Fecher et al., 2012; Classen et al., 2012; Taenzler et al., 2012). The NMM may also include such features. Therefore, it may be expected that other mechanisms would have lower transaction costs than the CDM. It should be noted though that a certain level of transaction costs are necessary to ensure that the offset mechanism maintains a certain degree of environmental integrity; below a certain threshold of the minimum transaction costs necessary to be incurred, there is an obvious trade-off between lowering transaction costs and ensuring environmental integrity.

Table 4. There are many costs associated with the CDM project cycle

Item	Current cost level	Recipient
Feasibility study	€10,000–20,000	Consultant
Methodology development	€70,000–120,000	Consultant
Methodology development	$1,000	UNFCCC secretariat
Development of project design document	€15,000–75,000	Consultant
Letter of approval	€0–2,000	DNA
Validation	€20,000–50,000	DOE
Negotiation of Emission Reduction Purchase Agreement	Depends on type of contract	Lawyer
Registration	No fee for projects <15,000 annual CERs. $0.10/forecast annual CER <15,000; $0.20/forecast annual CER >15,000, capped at $350,000. Projects in the LDCs and countries with <10 registered projects are exempt	UNFCCC secretariat
Monitoring	Depends on equipment	Consultant
Verification	€10,000–15,000, cost of first verification higher	DOE
Issuance	$0.10/annual CER <15,000; $0.20/annual CER >15,000. Paid registration fee is deducted	UNFCCC secretariat

Source: Michaelowa (2012b).

Is one market for offsets preferable as a means to improve market functioning by reducing price volatility?

Volatility of carbon prices is undesirable when it comes to incentivising emission reductions, as investors need certainty of the price level over a long time period to be able to make investment decisions on large-scale projects that reduce emissions. Price volatility is an important issue in the context of the regulated carbon markets. Under the EU ETS, the price collapse in the first phase and the drop in prices following the 2008 crisis entailed increased volatility, leading policymakers to express concerns about the long-term price signal of the scheme. In response, the United Kingdom plans to introduce a carbon price floor from 2013. In the United States and Australia the debate surrounding price volatility primarily highlighted a concern about undue upward price fluctuations and incited proposals for safety valves.

The more integrated a market is, the less volatile prices should be, all else being equal (Jacks et al., 2009). Linking carbon markets, either directly or indirectly, is one way of reducing price volatility induced by regulatory changes and regional economic shocks. Whereas allowing interscheme trade exposes any given ETS to shocks in another ETS, direct linking would imply that ultimately the effect on the global carbon price is less than it would have been in an autarkic market (Fankhauser & Hepburn, 2010). An indirect link would also have the same dampening effect on price volatility as a direct link (Ranson & Stavins, 2012; Gruell & Taschini, 2010).

For the sake of increasing the interdependence of carbon markets and reducing price volatility, having the CDM as a common offset mechanism across different carbon markets would arguably be preferable to a world in which the new carbon markets do not use offsets, only use domestic offsets or develop their own international offsetting mechanism. The NMM may be able to act as a similar indirect linking platform, once it is sufficiently liquid and has several regions linked up.

3.4.4 Assessment against CDM objective 2: to promote sustainable development

This section assesses the extent to which the CDM may contribute towards achieving the second objective of the CDM, namely to promote sustainable development through capacity-building, investment or other financial flows, technology transfer or otherwise, compared with the three alternative scenarios. This is summarised in table 5.

In the event that the alternatives are to allow domestic offsets only or no offsets at all in new carbon markets, it is likely that allowing the use of CERs in new carbon markets would at least give rise to some sustainable development benefits in project host countries. Allowing the fungibility of CERs would be likely to lead to at least some transfer of financial resources towards project host countries that would otherwise not take place, and which may assist with their development priorities.

In the case that international offsets other than CERs were allowed to be used, whether more sustainable development benefits would materialise if the CDM were used depends on the specifics of the alternative mechanism.

The opinions expressed in the literature on the sustainable development benefits of the CDM are mixed. Project design documents make claims to such benefits in virtually all cases. However, there is little ex post monitoring of those benefits, so little direct evidence as to whether they materialise. Also a number of complaints have been made related to labour and human rights issues and the breach of local environmental and social guidelines. Nonetheless, it is safe to assume that at least some sustainable development benefits have materialised as a result of the CDM. Looking at the commonly applied social, economic and environmental criteria of sustainable development benefits that are found in the literature, Spalding-Fecher et al. (2012, p,25) conclude that the "majority of the studies agree that the CDM does have a positive impact on the various facets of sustainable development in CDM host countries". Further, the authors note that studies suggest that there are likely to be differences in the level of sustainable development created by different types of projects, but that "there seems to be unanimity on the point that renewable energy projects can be particularly beneficial for developing countries".

In addition, research reviewed by Michaelowa (2012b) indicates that the CDM facilitated technology transfer, and financial flows in terms of volume of CER transactions, worth more than $30 billion between 2004 and 2011. Furthermore, there have been many capacity-building efforts associated with CDM project development by international organisations such as the World Bank, which may have spillover effects that generate sustainable development benefits. It may also be expected that the shift to programmes of activities (PoAa) under the CDM, which are taking place mostly in the LDCs, will lead to more sustainable development benefits.

Table 5. Allowing the use of CERs in new carbon markets may lead to more sustainable development

Key question/ alternative scenario	**No offsets allowed**	**Predominantly domestic offsets allowed**	**Other international offsets, not CERs**
Does allowing the fungibility of CERs promote capacity-building for sustainable development more than other offset mechanisms?	CDM projects are likely to build at least a small amount of capacity in their host countries	CDM projects are likely to build at least a small amount of capacity in their host countries	International scrutiny under the COP would be likely to be lacking; host-country government involvement depends on the design of the mechanism
Does allowing the fungibility of CERs promote the transfer of finance for sustainable development more than other offset mechanisms?	CDM projects are likely to transfer at least some finance for sustainable development to their host countries	CDM projects are likely to transfer at least some finance for sustainable development to their host countries	
Does allowing the fungibility of CERs promote the transfer of technology for sustainable development more than other offset mechanisms?	CDM projects are likely to transfer at least some technology to their host countries	CDM projects are likely to transfer at least some technology to their host countries	

Source: Vivid Economics' analysis.

Furthermore, the influence that the COP has on the objectives and functioning of the CDM implies that there is a built-in check on sustainable development in so far as this is desired by host-country governments. The CDM already has the unique feature of DNAs in CDM host countries, which have to issue letters of approval as part of the CDM project cycle, at which point the prospective materialisation of sustainable development benefits is checked. The stringency of assessing sustainable development benefits is at the discretion of the project host country and has been more relaxed in some countries than others, but overall this system ensures that there is a possibility for CDM host countries to align their domestic CDM project development with the sustainable development objectives of their domestic policies.

Given the lack of experience with new offset mechanisms, there is no body of literature that estimates the sustainable development benefits resulting from them. Only a few indicators can be found, based on the expressed intentions of regulators and the project methodologies that have been approved, or are intended to be approved, in the future.

- Japan has been critical of the sustainable development benefits brought about by the CDM and proposes to give procedural and financial preferential treatment to projects which it perceives to yield a high degree of co-benefits, such as reduction of air and water pollution under the BOCM. It also intends to engage in many capacity-building activities, which may generate sustainable development benefits, and also explicitly aims to transfer Japanese technologies to developing countries (Michaelowa, 2012b). At the same, it is also an explicit goal of Japan to cover projects that are not approved under the CDM, including clean coal and nuclear power generation, which may have relatively little sustainable development benefits.

- The Californian regulator has expressed its intention to consider qualitative restrictions on project types or geographical areas to ensure that additionality requirements are met and sustainable development benefits are provided, for instance by encouraging offset projects in the LDCs where such benefits are likely to materialise (Taenzler et al., 2012).Thus far the CAR, which may in future supply offsets to the Californian ETS, has restricted its use of international offsets to those generated by REDD+ projects in Mexico and Brazil. Those projects may offer sustainable development benefits to local populations.

- In the case of a sectoral approach to crediting, possibly under the NMM or some other mechanism, the focus may be on projects in the industrial and transport sectors in advanced developing countries. Projects in these sectors arguably offer less sustainable development benefits than small-scale projects in the LDCs.

Overall, it is arguably so that the oversight of the CDM by the COP, which allows for significant influence of CDM host countries in relation to various aspects, including sustainable development, gives rise to more sustainable development benefits under the CDM compared with under other offset mechanisms.

3.4.5 Assessment against CDM objective 3: support new action by a range of countries leading to global abatement

This section analyses the merits of allowing the use of the CDM in new carbon markets compared with the use of other offset regimes in the light of the third objective of the CDM, namely to support new action by a range of countries leading to global abatement, including incentivising mitigation policy in CDM host countries. The analysis is summarised in table 6.

Is there any evidence that allowing the fungibility of CERs is associated with more ambitious policies?

The analysis presented above indicates that using CERs decreases the costs of reducing emissions substantially. Here, a second-order effect is considered: does the improved cost-effectiveness lead to more ambitious policies? That is, are policymakers willing to take on more ambitious emission reduction targets when they know that emission reductions can be realised at a lower cost than in the absence of an offset mechanism?

There is no empirical evidence of this dynamic to date, as the CDM was not operational when the targets under the Kyoto Protocol were set. It is as yet unclear what impact the availability of offsets and flexible mechanisms may have on future target setting, although, as Spalding-Fecher et al. (2012) note, the current climate negotiations are informed by quantitative analysis over future offset supply.

In the case that cheap domestic offsets would be available otherwise, there may be less willingness to adopt more ambitious targets if CERs were allowed, as the use of CERs would imply a transfer of wealth to other countries. However, if domestic offsets were relatively expensive, allowing the use of CERs may lead to more willingness to adopt

Table 6. New action as a result of allowing the use of CERs in new carbon markets may exceed that achieved by other offset regimes

Key question/alternative scenario	No offsets allowed	Predominantly domestic offsets allowed	Other international offsets allowed, not CERs
Is there any evidence that allowing the fungibility of CERs is associated with more ambitious policies?	Allowing the use of CERs, which provide cost-effective emission reductions, may lead to more ambitious emission reduction targets, although there is little evidence of this dynamic to date	Allowing the use of CERs may lead to an unwillingness to increase emission reduction ambitions, as this implies international instead of national wealth transfer, or a willingness to do so if domestic offsets are comparatively expensive	Allowing the use of CERs might lead to lower emission reduction targets if other offset mechanisms are expected to generate cheaper offsets
Does the added momentum provided to the CDM by new CER buyers preclude other non-Annex I countries from taking action?	It may reduce the incentive of CDM host countries to accept emission reduction targets as they would be required to give up a mechanism whereby 100% of the incremental costs of the low-carbon alternative were met by international financial flows		The reluctance to accept emission reduction targets depends on the likelihood of access to finance from other international offset mechanisms as compared with the CDM
Does the added momentum provided to the CDM by new CER buyers lead to the faster implementation of ETSs in non-Annex I countries?	It may lead to more capacity-building in non-Annex I countries towards the implementation of ETSs, but may also reduce the incentive to cap sectors with the potential for CDM project development		The impact on the incentive to implement ETSs depends on the design of offset the mechanism compared with the CDM

Source: Vivid Economics' analysis.

more ambitious targets. Similarly, if alternatively a country were to use its own international offset mechanism or sectoral credits, then using the CDM would only lead to more ambitious targets if CERs were cheaper than the alternative international offsets. However, again, there is little evidence available to support these hypotheses.

Does the added momentum provided to the CDM by new CER buyers preclude other non-Annex I countries from taking action?

Another second-order effect that should be considered is that more demand for CERs adds momentum to the CDM, which may lead CDM host countries to avoid taking action. More specifically, in the event that new and emerging carbon markets create new demand for CERs, this signals a willingness to continue to increase flows of financial transfers for abatement in developing countries through the CDM. With the prospect of such international financial transfers, offset-project host countries may be less inclined to implement mitigation policies and adopt emission reduction targets themselves, as they would effectively be giving up a mechanism whereby the full incremental costs of a low-carbon alternative are met by international financial flows.

Allowing the use of CERs in new and emerging carbon markets may cause this second-order effect in the event that the markets would otherwise not allow the use of offsets or would allow the use predominantly of domestic offsets.

In the case that new carbon markets would otherwise use a different international offset mechanism, the reluctance of offset-project host countries to take action depends on the ease of access to financial flows under that alternative offset mechanism compared with under the CDM. It appears that the BOCM will be focusing mainly on South-East Asia and the CAR on REDD+ projects that may potentially become eligible for offsetting in Latin America, which implies that under these mechanisms this second-order effect may only affect those regions (see section 3.2.4). As such, the above-mentioned signalling effect of adding momentum to the mechanism may be less strong in the cases of the BOCM and the CAR than in the case of the CDM, the latter having a broader geographical coverage. However, when the alternative is sectoral crediting, under the NMM or otherwise, a similar effect may arise as in the case of the CDM if sufficient scale and geographical coverage is achieved. Indeed, the effect may be even greater in the event that sectoral crediting achieves greater international transfers of resources than achieved by the CDM.

Hence, in theory, allowing CERs to be used in new carbon markets and thereby adding momentum to the CDM may lead to an incentive for CDM host countries not to take new mitigation action but the effect may be smaller than in a situation in which sectoral mechanisms lead to a greater transfer of international resources. However, some observations indicate that such an incentive may not generally arise and that a differentiation between different types of mitigation action is warranted.

- Firstly, rather than disqualifying sectors from receiving CDM finance, CDM finance may help to leverage domestic action. Although it is difficult to demonstrate whether CDM finance causes additional domestic action or whether domestic action supports inflows of CDM finance, the two often go together. This is particularly evident in the case of China, where policies supporting the renewable energy sectors are neatly complemented by inflows of CDM finance, with CDM finance being only a small component of the overall policy portfolio (Thomas, Dargusch & Griffiths, 2011). Thus, the prospect of more CDM finance in the future may move governments to support mitigation technologies that may benefit from CDM finance at a later stage.

- Secondly, a possible counterbalance to this incentive would materialise if a CDM host country were developing so rapidly that it faced increasing international pressure to take action itself. The CDM will not make much of a difference in terms of changing incentives in the existence of such pressures. This is arguably the case with China.

In sum, the prospect of increased demand for CERs may lead CDM host countries to be less eager to implement an ETS, as that would be likely to threaten the ability of capped sectors to attract CDM finance. However, other domestic action, such as support for renewable energy projects, may in fact lead to more inflows of CDM finance, as long as the policies are financially complementary and not substitutes which would threaten project additionality.

Does the added momentum provided to the CDM by new CER buyers lead to the faster implementation of ETSs in non-Annex I countries?

One potential outcome of the climate negotiations is for all countries to have emission reduction targets and ETSs that are globally interlinked. To that end, allowing CERs to be fungible in new carbon markets may speed up the implementation of ETSs in CDM host countries. It would add momentum to the CDM and this new demand for CERs would lead to more CDM projects being developed, potentially in new regions and sectors. These projects could have a demonstrative effect to the extent that they could make policymakers aware of the potential of emission reduction projects and both the concept of, and market infrastructure required for, emissions trading. It is often argued that China's current eagerness to implement regional ETSs is, to a large extent, due to the country becoming acquainted with emission reduction projects and developing some of the necessary infrastructure through the CDM.

Therefore, in the case that a new carbon market would otherwise allow no offsets or only domestic offsets, allowing the fungibility of CERs may be more conducive to moving towards a world with many emission reduction targets and ETSs, by indirectly boosting the capacity-building benefits of the CDM in advanced developing countries.

Other forms of international offsets might be either better or worse at helping to build the capacity needed to move towards a domestic ETS. In particular, it is plausible that a sectoral trading approach would be more conducive to a transition to ETSs in host countries than the CDM, by setting benchmarks, implementing systems for MRV and establishing other institutional infrastructure that is needed to develop a fully fledged carbon market at a later stage (Fujiwara, Georgiev & Alessi, 2010; Taenzler et al., 2012).

3.4.6 Conclusions on the fungibility of CERs in new carbon markets

The advantages and disadvantages of allowing CERs to be fungible in new carbon markets have been discussed in section 3.4. The possible impacts of allowing CERs to be fungible were compared with situations in which:

- No offsets are allowed;
- Predominantly domestic offsets are allowed;
- International offsets other than CERs are allowed.

The three objectives of the CDM that have been identified in this paper are:

- To harness cost-effective emission reductions for Annex I countries;
- To promote sustainable development in CDM host countries;

- To support new action by a range of countries leading to global abatement (although it is noted that this not an objective mentioned in the Kyoto Protocol[10]).

There are a number of key questions that arise in the context of allowing the fungibility of CERs in new carbon markets. In most cases there is at least some ambiguity as to how the objectives of the CDM might be affected by allowing CERs to be fungible in new carbon markets, as compared with what might happen otherwise. The following observations can be made when assessing each of the scenarios against the three identified objectives of harnessing cost-effective emission reductions for Annex I countries, promoting sustainable development and encouraging action in a broader range of countries.

Harnessing cost-effective emission reductions for Annex I countries

With regard to the first objective of harnessing cost-effective emission reductions for Annex I countries, the following findings emerge:

- The first issue concerns the environmental integrity of the different mechanisms. The environmental integrity of the CDM may be expected to be greater in the short to medium run as compared with that of other offset mechanisms. The institutional capacity that has been created and the ongoing reforms of the CDM may provide an advantage over other mechanisms, especially in situations in which the trajectory of global climate negotiations is that offset mechanisms have only a temporary role. However, it is possible that, in the future, new mechanisms may learn quickly and achieve a similar degree of environmental integrity to the CDM. Mechanisms with a sectoral approach may be more adept at dealing with concerns around environmental integrity, particularly additionality and leakage.

- Apart from whether projects actually reduce emissions, it should be considered whether such emission reductions are comparatively cost-effective. In this regard, there is a clear advantage to linking to a common, deep and mature market for offsets such as the CDM, as compared with linking to a new and smaller international or domestic offset mechanism, as the CDM's broad geographical coverage allows the places where abatement is most cost-effective to be identified. Also, there is an advantage to the CDM in that it may serve as an indirect link between different ETSs, which dampens carbon price volatility globally. Nonetheless, the cost-effectiveness of the CDM, resulting from its ability to identify the lowest-cost abatement options and the benefits associated with it reducing price volatility, is compromised by the traditionally high transaction costs associated with CERs. These transaction costs may, however, be brought down as a result of the ongoing CDM reforms.

Promoting sustainable development in CDM host countries

The outcome of the assessment against the second objective of the CDM of promoting sustainable development in project host countries indicates that, despite the criticism of the CDM in this regard, the CDM is likely to have a clear comparative advantage over other offset mechanisms in this area. The oversight of the CDM by the COP and the sustainability check that project host countries can apply ensures that at least some sustainable benefits can be achieved through the CDM. In addition, the project types that other mechanisms are intending to develop may not have similar sustainable development benefits to many of the PoAs and small-scale projects in the LDCs that are now increasingly being developed under the CDM. The new offset mechanisms have expressed concerns about sustainable development benefits more generally and may want to promote such benefits by imposing qualitative restrictions on project types and geographies.

Supporting new action by a range of countries leading to global abatement

In relation to the third objective of the CDM of supporting new action by a range of countries leading to global abatement, there are a number of important issues to be addressed.

- Firstly, it should be considered whether allowing the use of CERs in new carbon markets would lead to more ambitious emission reduction targets. As compared with an alternative scenario in which no offsets or predominantly domestic offsets would be allowed, in principle this is possible, since international offsets allow access to more cost-effective abatement options, but there is little evidence of it happening in practice.

- Secondly, an important second-order dynamic resulting from adding momentum to the CDM by allowing CERs to be fungible in new carbon markets may be that CDM host countries would have a reduced incentive to take action themselves. The results of the analysis are ambiguous

10 It is a matter for the Parties to decide whether this additional objective should be formally considered and the extent to which considerations under this third objective should influence decision-making on the nature of the agreed objectives.

in this respect. Other things being equal, it may be that more demand for CERs would lead CDM host countries to steer clear of implementing ETSs, as sectors covered by ETSs may become ineligible for CDM finance. On the other hand, the example of China indicates that even sectors with extensive government support may benefit from CDM finance, meaning that domestic action might leverage CDM finance and so there will be an incentive for countries to take domestic action.

- Finally, the CDM may incentivise the transition to a domestic ETS in its host countries, as it could make regulators aware of the potential for emission reductions and become acquainted with the concept of emissions trading and some of the infrastructure required. The range of countries which currently host CDM projects and which are considering implementing domestic ETSs, such as China, South Korea and Brazil, indicates that the project-based nature of the CDM is not a barrier to such a transition. Whether other international offset mechanisms would perform as well in that respect is difficult to say, but it is possible that sectoral approaches would build more capacity for the transition to a domestic ETS in a host country.

From this analysis it appears that allowing CERs to be fungible in new carbon markets is generally desirable, particularly in the case that the CDM reforms are continued and successfully implemented. In order to facilitate this, the CDM should work with regulators of new markets and consider reforms which will increase the likelihood of the fungibility of CERs in those markets.

3.5 Options for the future governance of the CDM

A key question for Parties is whether the CDM should have a centralised or hybrid governance structure

This section addresses the issue of the future governance of the CDM. Section 3.5.1 looks at the extent to which governance roles should be centralised or decentralised. It particularly focuses on the question of the extent to which the fungibility of CERs should be encouraged in a decentralised governance structure, if such a structure leads to increased market fragmentation and a higher risk of reduced environmental integrity. As well as the question of **what** roles should be undertaken centrally, there is also the question of **who** should undertake such centralised roles and, in particular, whether this should continue to be the UNFCCC. This is considered in section 3.5.2.

3.5.1 Options for the future governance of the CDM

The governance structure of a future mechanism could embrace a number of roles, not all of which are mutually exclusive:

- A centralised approval body, similar to the operation of the CDM today;
- A rule-setter, whereby a centralised body sets and monitors one or more standards, which can then be adopted by various approaches;
- A provider of best-practice guidelines, but leaving Parties free to make their own rules about offsets;
- An independent reviewer of the approaches to offsetting being pursued by Parties but with no power of accreditation;
- A repository for Parties to deposit the rules for offsetting which apply in their own domestic schemes, which may or may not be available for public viewing.

Table 7 outlines the broad options for structuring the governance of a reformed CDM or an NMM.

There are a variety of new mechanisms on offer. Many Parties that are proposing new mechanisms are also expressing a desire to link to a central organisation (and, as discussed in section 3.5.2, the UNFCCC in particular) but to retain significant autonomy over design elements, and are therefore calling for a hybrid model of governance. Some other Parties fear that a lack of centralised control will lead to an erosion of environmental integrity and to fragmentation of international carbon markets, and so are calling for a centralised governance structure.

Given the current state of the relevant negotiations and the requests that have been submitted by relevant stakeholders, it can be cautiously presumed that any NMM or reformed CDM will have either a centralised or hybrid governance structure. The key distinction between these options,

and thus the key decision that will need to be made by the COP, is whether projects require approval at a centralised level, or whether this can be granted domestically by a locally appointed approval body. In either case, requirements such as those regarding MRV would be administered by the overarching organisation.

Table 7. Centralised, hybrid and decentralised governance structures have been proposed for the future CDM

Governance structure	Description
Centralised	A centralised governance model is one in which the major governance functions, including oversight of methodologies, setting of baselines, issuing of credits and assessing of compliance, are all under the control of an overarching organisation, presumably the UNFCCC. The current CDM is an example of such a governance structure.
Hybrid	A hybrid governance model would set only basic criteria, such as regarding MRV, avoidance of double counting, and the recording of the use of credits within the mechanism. While the mechanism would be based on standardised principles (set by the central organisation/UNFCCC) and may involve a number of different standards, the project host countries could play a major role in designing it, implementing it and securing its transparency. There would also be fixed eligibility criteria that might specify such requirements as a credible national system for estimating emissions. Whether units meeting each of the possibly different standards were eligible to count towards meeting international emission reduction commitments would be a matter for the COP to decide.
Decentralised	A decentralised model of governance is one in which all regulation, monitoring and issuing of credits is done bilaterally, with no overarching requirements imposed on countries that choose to use the mechanism. While the framework of the mechanism may be negotiated and shaped at an international level, this would be the only centralised component.

Sources: Sépibus & Tuerk (2011) and Vivid Economics.

A more decentralised or hybrid system of governance would increase the likelihood of particular new and emerging carbon market mechanisms engaging formally with the CDM and allowing the fungibility of CERs. This has significant benefits, as outlined earlier in this chapter.

There are three key objections to a hybrid governance structure:

- Increased market fragmentation;
- Reduced environmental integrity;
- Reduced incentives to engage proactively in coordinated international action.

The first of these concerns, market fragmentation, is unlikely to be important in practice. Various approaches pursued domestically by Parties cannot be prevented and are already happening, and so market fragmentation appears inevitable. If a centralised governance model is pursued, then some schemes, such as regulators in California and Japan are currently proposing, will simply decide not to have any formal links with UNFCCC mechanisms. If a hybrid governance structure could entice such schemes to pursue links with the CDM or its successor, then market fragmentation would be reduced. Of course, the option of a hybrid governance structure may encourage some regulators to diverge from the core CDM standards in a way that they would not have done with a centralised governance structure. It is impossible to know how regulators will act in the future, but the known benefits of a hybrid structure by bringing certain large emerging markets into the UNFCCC framework against the uncertain future incentive effects lead to the conclusion that market fragmentation is not a reason to oppose hybrid governance.

The second of the above concerns, that of reduced environmental integrity, is based upon the notion that allowing a range of standards could result in a 'race to the bottom', whereby countries seek to reduce environmental standards in order to generate the maximum number of credits and therefore reduce true mitigation. There is an analogy of such a dynamic in the voluntary markets for offsets operating alongside the CDM today. The voluntary markets have a range of standards, such as the Gold Standard and certain REDD credits, which are outside of the Kyoto Protocol markets. The experience gained from these markets has been that transparency and peer judgement can maintain a demand for credits of a higher standard, even when cheaper credits with perceived lower environmental integrity exist (Michaelowa, 2012b). Some Parties, such as New Zealand, have argued that transparency and appropriate structures can achieve environmental integrity alongside a hybrid governance model. This is certainly true in theory, although, of

course, it depends upon the extent to which the COP is able to agree to the required structures. It would be desirable to have a single standard, as is the case today, but this needs to be traded off against the likelihood that a centralised governance model will reduce the number of Parties formally engaging with UNFCCC mechanisms. In the short term, in which some major new and emerging schemes are already proceeding outside of the UNFCCC, it does not seem that a centralised governance structure can prevent the creation of offsets with different environmental standards. Whether these are recognised as counting towards meeting Parties' international emission reduction commitments is, of course, a matter for the COP to decide.

The third of the concerns – that a hybrid governance model reduces the incentive to participate in international mechanisms – faces similar arguments to those regarding environmental integrity, in that there is already a proliferation of offset schemes outside of the UNFCCC mechanisms. In the longer run, the users of such offset schemes may find that the COP does not recognise the units as counting towards meeting international emission reduction commitments, although that is a matter of speculation surrounding future decisions of the COP.

There are clear advantages to a centralised governance model if such a model would prevent a proliferation of standards and create stronger links between different mitigation schemes. However, given the seemingly inevitable proliferation of offset schemes, it may be desirable to maximise voluntary engagement by pursuing a hybrid governance model, provided that the surrounding architecture can be made sufficiently strong so as to ensure environmental integrity.

3.5.2 Should the CDM remain embedded in the UN/UNFCCC?[11]

Given that there appear to be good arguments in favour of a continued role for an international regulatory body within the CDM, following either a centralised or hybrid governance model, there remains the question of which body should perform this role and, in particular, whether it should be the UN/UNFCCC.

The consultations carried out by the High-Level Panel found very limited support for the notion that the CDM should be removed from the UNFCCC, with most stakeholders expressing a preference for the CDM to remain under the UNFCCC.

The consultations suggested that there is a general view that the CDM and the international community stand to benefit from the CDM remaining under the UNFCCC, taking the view that this:

- Maximises legitimacy and global representation, as noted, for example, by US carbon businesses, the Designated Operational Entities and Independent Entities Association and others;
- Keeps the CDM in step with global climate negotiations;
- Ensures access to the significant institutional knowledge and experience of the UN Secretariat, as noted by the Africa Carbon Forum;
- Gives rise to important crossover benefits from the UN operating both the CDM and JI, as noted by the secretariat.

In addition, Parties to the Convention would probably not support removing the CDM from the UN, raising questions about the political feasibility of that idea. Outreach suggests that Parties wish to continue providing policy guidance to and political oversight of the CDM; developing countries in particular wish to maintain some oversight of the CDM given the significant impact of the CDM on their countries. Parties might also be concerned about how removing the CDM from the UNFCCC might change the quality and integrity of the emission offsets, or that an independent CDM would establish its own sustainable development criteria, rather than deferring to those of national and local authorities.

Furthermore, many stakeholders expressed the view that many of the perceived benefits of removing the CDM from the UN/UNFCCC (greater efficiency and technical competence) could be achieved by implementing more modest reforms within the current UN/UNFCCC structure, including by:

- Streamlining the project cycle;
- Improving the quality of DOE/DNA's submissions to the EB, to reduce the workloads of the EB and the secretariat;
- Reforming the verification and validation systems;
- Expanding outreach to underrepresented regions;
- Improving the approach to determining additionality;
- Implementing standardised baselines and methodologies;

11 This material was kindly provided by Samuel Grausz and Nigel Purvis.

- Professionalising the EB or ensuring that it focuses on strategic issues;
- Experimenting with new types of credits, including sectoral and PoA approaches;
- Creating an appeals process;
- Strengthening stakeholder consultation.

3.6 Conclusions on the role of the CDM in relation to new and emerging carbon markets

New carbon markets are on their way, and the CDM must interact with them

In this chapter the future role of the CDM in relation to new and emerging carbon markets has been elucidated. Currently, demand for CERs is highly concentrated, with demand from the EU ETS accounting for around 90% of the total demand for CERs. In the current context, the EU ETS plays a critical role in the CER markets and has a strong influence over the level of demand for CERs and the types of CERs generated. CERs are also used in a number of smaller carbon markets, such as in New Zealand. A key development over the coming few years will be the emergence of a variety of new carbon markets, some of which will be outside of the Kyoto Protocol entirely and not all of which will be in countries with emission reduction commitments under the Kyoto Protocol. This development could change the nature of the relationship between the CDM and other carbon markets and poses a number of questions which need to be addressed in determining the future architecture of the CDM:

- What is the current intention of these new and emerging carbon markets with respect to accepting CERs for compliance? Why?
- Is it desirable to allow offsets in general (and CERs in particular) to be accepted in new and emerging carbon markets?
- If so, in which ways should the CDM be reformed in order to encourage such fungibility of CERs?

The key conclusion of this chapter is that the fungibility of units from the CDM in new and emerging carbon markets is generally desirable and should be encouraged where possible. The fungibility of CERs in more carbon markets will increase demand for them, which will support the scaling up of activity under the CDM. So long as the CDM is seen to be achieving desirable outcomes, then this is a desirable situation. The indirect linking role that CERs can play also increases the economic value that can be created from carbon markets and reduces costs. It is possible that some dynamic political considerations may call for a more limited fungibility of CERs, but there is not sufficient evidence to support any claim that such considerations override the other advantages.

In several jurisdictions the use of the CDM as a standard-setter for their international offsets is not the default choice. This was illustrated in section 3.2. Concerns about the environmental integrity, scalability and slow and bureaucratic approval processes of the CDM make Japan and California, in particular, reluctant to use the CDM as their main source of offsets. Accordingly, they are developing their own international offset mechanisms that aim to address those issues. This proliferation of offset standards for compliance in various jurisdictions raises the question of whether the CDM should be more proactively pursuing acceptance by these jurisdictions in order to evolve into the global standard-setter for offsets in international carbon markets.

Section 3.3 addressed the issue of whether or not, theoretically, it is desirable to allow links between different ETSs. It showed that both direct and indirect linking have the potential to significantly increase the environmental effectiveness and cost-effectiveness of the global climate policy architecture, but that indirect linking allows for many of the benefits to be realised without compromising the regulatory independence of the different schemes in the way that would be implied by direct linking.

Section 3.4 took this conceptual analysis and asked whether it is desirable to make CERs (in particular) fungible in new and emerging carbon markets, taking into account the objectives of the CDM. The extent to which the use of the

CDM or alternative offset regimes (i.e. no use of offsets, use predominantly of domestic offsets or use of international offsets other than CERs) would be able to fulfil these objectives was considered.

It was shown that the CDM, by offering offsets from geographically disbursed locations, is more likely to allow for cost-effective emission reductions than offset schemes with a narrow geographical focus (either domestic or international). There are continuing concerns about the transactions costs of the CDM compared with those of other mechanisms, although there are continued efforts to reduce these to the minimum necessary to perform regulatory functions efficiently. That said, sectoral mechanisms offer the prospect of greater volumes of offsets and hence a reduction in unit transaction costs.

In addition, the environmental integrity of the CDM is presumably relatively high, owing to the extensive institutional capacity supporting the mechanism and the recent progression of reforms, such as introducing standardised baselines. It is, as yet, unclear whether the environmental integrity of other international offset mechanisms can be safeguarded to a similar extent, although their administrators have expressed the intention to do so.

Further, despite the criticism of the sustainable development benefits generated by the CDM to date, the governance of the CDM, with its substantial influence over its host countries, seems to ensure a comparative advantage of the CDM in terms of securing sustainable development benefits.

Finally, new mitigation action in CDM host countries may crowd out CDM finance, on the one hand, as such government support may threaten the financial additionality of projects, but, on the other hand, host-country policies other than ETSs may complement the CDM neatly and thus actually improve the inflow of CDM finance. Thus, adding momentum to the CDM may not per se discourage CDM host countries from taking mitigation action themselves, but may in fact demonstrate the potential for emission reduction and build capacity for introducing ETSs at a later stage (although a sectoral approach may be preferable for building capacity for the transition to an ETS).

It is hence concluded that it is desirable for CERs be fungible in new and emerging carbon markets.

Section 3.5 elaborated on options for the future governance of the CDM and changes that would have to be made to the CDM to facilitate its greater use in new carbon markets. A hybrid governance model could be pursued, in which countries that generate demand could exert a certain amount of influence over the certification process according to their specific requirements. The CDM should continue its process of reform so as to address the concerns about its functioning that most Parties have expressed. It was confirmed that most stakeholders have a preference for the UN/UNFCCC undertaking whatever role is performed by a centralised body.

4. Including REDD+ in the CDM

There are benefits and risks involved in including REDD+ in the CDM

Chapter contents

There would be benefits to including REDD+ in the CDM

The treatment of forests continues to evolve under the Convention and Kyoto Protocol, with the most recent developments under the Convention advancing REDD+ considerably. A next step, which has been gradually gaining attention in recent climate negotiations, is the inclusion of REDD+ in the CDM. Currently several problems with this still exist, including issues surrounding environmental integrity, the potential for oversupply of offsets and the setting of baselines. Were such problems to be overcome, however, there exist a great deal of benefits that would be likely to result from the inclusion of REDD+ in the CDM.

"The benefits of including REDD+ in the CDM include: promoting sustainable development benefits; shifting the distribution of CERs towards a more equitable balance amongst countries; the ability to generate cost-effective emission reductions; and additional learning-by doing opportunities for both the CDM and REDD+."

4.1 Introduction[12]

REDD+ is advancing rapidly under the Convention and the Kyoto Protocol

The treatment of forests continues to evolve under the Convention and the Kyoto Protocol, with the most recent developments under the Convention advancing REDD+ considerably. However, a number of issues still remain to be resolved related to operationalising a REDD+ mechanism. The CDM, on the other hand, is currently considering expanding the scope of eligible land-use activities beyond afforestation/reforestation. A broader reform of the CDM beyond a project-based approach is also being contemplated. This creates the opportunity to critically review whether or not the CDM should be expanded to include REDD+ and, if so, how this could be done.

If REDD+ is to be included in the CDM, well-defined approaches exist under the current CDM and under likely reformed versions of the CDM, each of which brings advantages and disadvantages. The benefits of including REDD+ in the CDM include: promoting sustainable development benefits (a core objective of the CDM); shifting the distribution of CERs towards a more equitable balance amongst countries (i.e. many forested developing countries do not have many opportunities for projects in other sectors); the ability to generate cost-effective emission reductions (a second objective of the CDM); and additional learning-by doing opportunities for both the CDM and REDD+.

The risks of including REDD+ in the CDM include: a possible lack of environmental integrity, leading to increases in global emissions; the risk of oversupply of offsets and price collapse; institutional risks to and demands on the CDM; damage to local communities and indigenous groups if projects are not implemented with appropriate safeguards; and prejudging the outcomes of the relevant negotiations on both REDD+ and non-REDD+ issues. In our opinion, many of these risks can be reduced through careful design. The concerns about environmental integrity relate to additionality, baselines, leakage, non-permanence and quality of monitoring. In our opinion, many of these concerns can be adequately addressed. Some estimates of the potential of REDD+ are significant: up to 7.8 billion tonnes of emission reductions per year. These estimates are, however, the theoretical biophysical potential, and comparable to similar estimates for afforestation/reforestation, which have simply not materialised at this scale. Studies of the more realistic potential of REDD+ take into account technical and political constraints and yield estimates as low as 54 million tonnes of emission reductions per year at a price of $5–10/tonne, ranging up to 2.4 billion tonnes of emission reductions per year at a price of $10–20/tonne. Irrespective of potential supply, the amount of emission reductions generated by REDD+ actually credited through the CDM could nonetheless be controlled via quantitative caps or other mechanisms. The institutional risks could be overcome by appropriate increases in capacity and/or procedural changes; while the risks to local communities and indigenous groups should be addressed by implementing strong safeguards; and the risk of prejudging the outcomes of the relevant negotiations can be reduced by allowing flexibility in terms of how countries might pursue REDD+ through the CDM.

Four options with regard to including REDD+ in the CDM are reviewed below: (i) maintain the status quo and do not allow REDD+ into the CDM; (ii) allow some limited project-based REDD+ into the CDM; (iii) allow the larger-scale (subnational or national) reduction of emissions from deforestation activities into the CDM; or (iv) a combination of (ii) and (iii).

4.2 Background of REDD+ under the Convention and the Kyoto Protocol

REDD+ has figured prominently on the agenda for a long time

The integration of forest-related activities within the UNFCCC has been continuously evolving. Under the Convention, all Parties committed to taking measures to address both emissions by sources *and removals by sinks*.[13] Commitments for developed countries under the Kyoto Protocol,

12 This material has kindly been prepared by Climate Focus and Climate Advisers.

13 Article 4, paragraph 1(b), of the Convention. See also Article 4, paragraphs 1(d) and 2(a), which call for the sustainable management, protection and enhancement of sinks.

however, made a subset of land use mandatory, starting with afforestation, reforestation and deforestation and only recently expanding to forest management.[14] However, to date only afforestation and reforestation (A/R) have been included in the CDM. Other activities such as deforestation and forest management have been excluded, owing to a combination of uncertainty of the ability to monitor forest changes with sufficient accuracy, leakage and market flooding (Fearnside, 2002). To address the fears of market flooding, caps were put on the number of A/R credits a country could use, but CDM A/R credits have been a minor source of CDM offsets to date.

In 2005, at the eleventh session of the COP in Montreal, Papua New Guinea and Costa Rica requested the addition of a new, separate agenda item on deforestation under the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA). The scope was limited to "reducing emissions from deforestation in developing countries",[15] but has since been expanded to include not only deforestation, but also forest degradation, the role of conservation, sustainable management of forests and enhancement of forest carbon stocks, now known altogether as REDD+.[16] UNFCCC guidance on REDD+ has since developed, with recent affirmations by the COP of the need for national strategies and action plans, reference (emission) levels, robust and transparent national forest monitoring systems, implementation of safeguards and a step-wise approach to REDD+, as well as the importance of market-based finance to support REDD+.[17]

Despite the current level of interest in REDD+, a number of issues remain unresolved in international negotiations on REDD+, which could have an impact on the inclusion of REDD+ in the CDM. These issues include: (i) scale (i.e. whether REDD+ would be implemented at the project, subnational or national level; (ii) scope, including whether a country can 'pick and choose' amongst forestry sector activities, or they must cover certain activities as a matter of priority (e.g. deforestation); (iii) the relationship between financing and reference (emission) levels; (iv) the role of environmental and social safeguards; and (v) whether and how REDD+ would create offsets.

4.3 The integrity of REDD+ emission reductions and removals

The environmental integrity of REDD+ is sometimes questioned

The environmental integrity of REDD+ and forest-based offsets more broadly is sometimes questioned and used to argue for the exclusion of forest-based offsets from ETSs. The key issues affecting the environmental integrity of REDD+ offsets are: (i) additionality; (ii) baselines or reference (emission) levels; (iii) leakage; (iv) risk of non-permanence; and (v) quality of monitoring.

4.3.1 Additionality

Emission reductions achieved by CDM projects are to be "additional to any that would occur in the absence of the certified project activity".[18] This requirement would also apply to emission reductions achieved by REDD+ projects, if REDD+ were included in the CDM. There are challenges with additionality and REDD+, including the role of legislation and enforcement, protected area statutes and logging concessions (Robinson, Holland & Treves, 2010). However, additionality tools exist both for CDM A/R projects and for REDD+ and A/R projects under voluntary market standards, and there is no reason for assessing project-based additionality for REDD+ to be easier or harder than assessing additionality for A/R projects. Many experts take the position that, if baselines were correctly set, the emission reductions achieved by REDD+ projects on larger (political or

14 Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

15 Agenda item 6 under the AWG-LCA at COP 11: Reducing emissions from deforestation in developing countries: approaches to stimulate action.

16 Decision 1/CP.16

17 Decision 1/CP.16

18 Article 12, paragraph 5(c), of the Kyoto Protocol.

administrative) scales would automatically be additional to the baseline scenario.[19]

4.3.2 Baselines

Establishing baselines against which to measure performance is key to achieving environmental integrity. Complexities associated with land use related emission reductions mean that a pure extrapolation of historical averages will not always be adequate to set baselines for REDD+. There is experience in the voluntary market of setting baselines at the project level, and one voluntary standard is taking steps towards recognising subnational or national baselines.[20] Parties to the Convention have recognised this problem and have negotiated the possibility of having 'projected' baselines that aim to capture the expected level of emissions in a business-as-usual scenario when creating national or subnational reference (emission) levels.[21] Possible ways of managing the challenges imposed by baseline-setting on larger scales include allowing ex post adjustment of baselines to reflect difficult-to-predict factors like commodity prices and weather, or ensuring that baselines are 'conservative', for example requiring additional discounts of projected baselines before credits are issued (Brown et al., 2011). Finally, there is the risk of moral hazard in the near term if countries increase deforestation rates in preparation for an international REDD+ financing mechanism, although this risk could be negated by requiring historical baselines to be based on years prior to the widespread acceptance of REDD+ in international climate negotiations.

4.3.3 Leakage

Leakage occurs when emission reductions or removals achieved in one location are negated by increased emissions in another (e.g. protecting a forest from logging entails no benefits for the climate if the logging company moves its operations to another site). The problems of leakage can be more easily managed on larger scales if a comprehensive monitoring system exists that monitors all relevant activities (for example, deforestation can reduce while degradation increases, so both must be monitored). Implementing actions that address the drivers of deforestation can also reduce the risk of leakage. Finally, some types of drivers or activities are more prone to leakage than others.

4.3.4 Risk of non-permanence

The risk of non-permanence is the risk that emission reductions or removals will be lost in the future owing to the inherent vulnerability of forest carbon projects to fire, pests, mismanagement and other occurrences that cause a loss of forest carbon stock. Non-permanence is fundamentally about how to account for this risk and assign liability. There are a number of options for addressing this risk. With national-level REDD+, governments can be held accountable for permanence. Alternatively, buffer or reserve accounts that hold a certain amount of credits to be used to cover emission reduction reversals can, in theory, effectively manage the risk of non-permanence. However, while the buffer approach has been in operation for a number of years under the Voluntary Carbon Standard (VCS) and has over 1 million credits, its long-term resilience has not yet been tested and some models have shown scenarios in which the buffer may become bankrupt over the long term without adequate management or insurance (Duke University's Nicolas Institute for Environmental Policy, 2012). Temporary credits, as are used for CDM A/R projects, can address non-permanence as well, but have proven unpopular in the market.

4.3.5 Monitoring

Effective and accurate monitoring is integral to ensure that the benefits to the climate are real. Potentially ineffective monitoring was one of the reasons given for credits from forestry projects being banned from the EU ETS (Trines, 2008). REDD+ projects rely on the same technology and procedures that CDM A/R projects use to estimate carbon stocks. Satellite and other technology has been improving since the negotiations on the Kyoto Protocol and advances in LiDAR and other remote-sensing technologies now allow credible monitoring of REDD+ projects on very large spatial scales (Asner et al., 2010).

19 Voluntary Carbon Standard (VCS) Jurisdictional and Nested REDD+ Technical Recommendations (2012).

20 See the VCS Jurisdictional and Nested REDD+ Initiative, available at http://v-c-s.org/JNRI.

21 Decision 12/CP.17.

4.4 Current and potential supply of and demand for REDD+ credits

Various factors would influence the supply of and demand for REDD+ credits

4.4.1 Supply

Potential supply of REDD+ credits can be assessed based on biophysical, technical and feasible potential. The biophysical supply is the expected net total carbon dioxide equivalent emissions from tropical forests for the time period in question (i.e. the theoretic amount of expected emissions). The technical supply represents biophysical supply constrained by economics (i.e. opportunity costs). Finally, the feasible supply represents the most likely range of actual REDD+ credits and is the technical supply further constrained by governance capacity, 'own efforts' (i.e. reductions not financed by carbon markets) and interest among potential supplier countries. Estimates of biophysical and technical potential for deforestation and forest degradation vary greatly depending on the study but can be extremely high, up to as high as 7.8 billion tonnes of emission reductions per year (McKinsey & Company, 2009). In comparison, the technical potential for A/R has been estimated at up to 7.3 billion tonnes of emission reductions per year (Richards & Stokes, 2004; Sohngen & Mendelsohn, 2003) (i.e. comparable to that for deforestation and forest degradation), but the actual supply of credits from A/R projects has nowhere near reached this technical potential. Analyses of the potential feasible supply of REDD+ credits yield far lower estimates, ranging from as low as 54 million tonnes of emission reductions per year at a price of $5–10/tonne to 2.4 billion tonnes of emission reductions per year at a price of $10–20/tonne, depending on the model used (Boucher, 2008; Coren, Streck & Madeira, 2011). However, all these estimates come from theoretical studies. Interviewed key project developers did not support the supposition of an imminent flood of hundreds of millions of credits or more, given current market conditions. Lack of robust and predictable demand significantly limits the capital available to project developers, as well as the competitiveness of forest conservation compared with the financial returns from exploitation – the fundamental requirement for REDD+ to be successful. The highly rigorous process of developing, validating and registering REDD+ projects is also expected to prevent many projects that are in the early stages of development from ever generating credits. Finally, as evidenced by CDM A/R, along with demand, the design of a market mechanism can also significantly affect the supply of credits.

4.4.2 Demand

Forest carbon credits currently have their largest share in voluntary markets: REDD+ and A/R credits combined in 2011 represented about 16% of the total volume transacted on voluntary markets, but comprised less than 0.1% of the volume transacted on all global carbon markets combined (Forest Trends Ecosystem Marketplace, 2012; World Bank, 2012). The Californian and Australian compliance markets provide the greatest potential demand for REDD+ credits in the near term. California has sent strong signals that REDD+ credits may be included in its scheme from 2015, which is when Australia will also start to allow international offsets. That said, there are important unresolved procedural issues and political uncertainties, particularly in Australia, which only has a theoretical opening for REDD+ (e.g. if it were included in the CDM). The Californian carbon market could theoretically consume 8.9–9.5 million (Point Carbon, 2012; Reuters UK, 2012) and Australia could potentially consume 70–104.2 million (Point Carbon, 2011; Reputex Consulting, 2012) REDD+ credits per year up to 2020. Other nascent compliance markets, such as in South Korea, Japan and Brazil, may provide additional demand in the coming years, but this is very uncertain at this point. Meanwhile, the EU ETS is unlikely to accept REDD+ credits prior to 2020.

4.5 How the inclusion of REDD+ in the CDM could affect the market for CERs

Market effects are difficult to quantify

The market effects of including REDD+ in the CDM are difficult to quantify, as they will be influenced by a number of factors. These include issues of: (i) how REDD+ will be included in the CDM (i.e. the design of REDD+ rules under the CDM); and (ii) whether there will be any demand or market for the credits. Both of these factors have influenced CDM and JI forestry projects and credits to date. CDM A/R projects make up only 0.9% of registered CDM projects and the lone registered JI forestry project represents only 0.3% of registered JI projects. Estimates of the volumes of credits likely to be generated by these projects tell a similar story of minimal representation,[22] despite studies, as noted above, showing that technical A/R credit supply could be extremely large, at 0.7–7.3 billion tonnes of emission reductions per year.

In contrast, the voluntary market has a wide variety of project standards that allow a wider range of project types and design elements. For example, the voluntary market deals with the risk of non-permanence differently from the CDM or JI, with the dominant standard (the VCS) employing a buffer approach that allows issuance of permanent credits. As a result, forestry projects represent a much higher market share than in the regulated market (see table 8).

If REDD+ is admitted into the CDM, the technical rules on how to develop and register activities will be important in determining how many credits actually come to market. Key design issues include:

- **Scope:** whether REDD+ projects can generate credits, or whether credits can only be generated by emission reductions within a State/province or country as a whole.
- **Baselines:** how a baseline (or reference emission level/reference level) is developed and registered.
- **Non-permanence:** how the risk of non-permanence is addressed (i.e. via temporary credits, a buffer reserve or other means).
- **Other eligibility and design criteria**, such as start date, safeguards (environmental and social), leakage and registration processes.

In addition to these design elements, the existence of demand will affect supply. If regional or national compliance markets do not allow REDD+ credits, the impact on other type of CERs is likely to be minimal. The Australian ETS currently has a ban on temporary credits from CDM forestry projects, but allows credits from JI forestry projects.[23] If REDD+ were included in the CDM, Australia may not recognise it, unless the temporary credit approach was replaced by another approach to manage the risk of non-permanence. It is likely that the Californian compliance market and the EU ETS would remain largely irrelevant, as the Californian compliance market is not tied to the CDM and the EU ETS is expected to continue to ban all REDD+ credits for the foreseeable future (Wehrheim, 2011).

If the design of the inclusion of REDD+ in the CDM were favorable to REDD+ projects, and demand for REDD+ credits

Table 8. Market penetration of forestry projects in the voluntary market

Project type	Afforestation/ reforestation in $MtCO_2e$	REDD+ in $MtCO_2e$	Forest management in $MtCO_2e$	All forestry/total voluntary market $MtCO_2e$
Volume	7.6 (10%)	7.3 (9%)	3.8 (4%)	18.7/95 (23%)

Sources: Climate Focus and Climate Advisers; Forest Trends Ecosystem Marketplace (2012).

22 Data on registered projects from www.unfccc.int. Data on projects under development and projected numbers of credits from http://www.cdmpipeline.org/.

23 See sections 4 and 61 of the Australian National Registry of Emissions Units Act 2011, which defines an eligible international emission unit; section 5 and part 6 of the Clean Energy Act 2011, which sets rules for the use of eligible international emission units; and the website of the Clean Energy Regulator http://www.cleanenergyregulator.gov.au.

existed, then an increase in the supply of REDD+ credits could be expected. A flood can nonetheless be prevented by putting quantitative caps on the use of REDD+ offsets, as has been done for CDM A/R offsets.

4.6 How REDD+ might be integrated into the CDM

Several options exist for integrating REDD+ into the CDM

If the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol were to maintain the structure of the CDM largely as it is, but consider making land-use activities beyond A/R eligible, three general categories of new REDD+ methodologies could be considered:

- Project-based crediting for new forest activities: there is growing experience in the voluntary REDD+ market with a range of project-based crediting methodologies, including for avoided deforestation and forest management. These existing project-based REDD+ methodologies closely resemble CDM requirements for defining baselines, determining additionality, etc. It is likely that they would be quickly adapted and proposed to the CDM.

- Sectoral CDM methodologies have proven difficult, owing partly to CDM design elements that are not accommodating to sectoral approaches, for example requirements for drawing project boundaries, defining additionality and constructing baselines (Schneider & Cames, 2009). These and other practical difficulties that have held back the development of sectoral CDM methodologies, including a lack of incentives for market players to develop methodologies, would also apply to REDD+.

- CDM PoAs are an unlikely first entrée for REDD+ into the CDM. PoAs were designed to allow small-scale projects to benefit from efficiencies of scale, whereas the trend in REDD+ has been towards accounting for emission reductions on larger rather than smaller scales to avoid concerns about leakage.[24] PoAs also require standardised projects and were designed for replicating small-scale projects. REDD+ does not fit this model well, as evidenced by the lack of bundled AFOLU or REDD+ projects in the voluntary REDD+ market to date.[25]

The future architecture of the CDM may open up new options for the inclusion of REDD+, particularly if it moves from project-by-project crediting systems towards sectoral crediting systems.[26] With more developing countries likely to take on emission reduction commitments, a reformed CDM could also move away from baseline-and-credit systems (offsets) towards trading systems with a target (cap-and-trade). If the CDM expands in one or both of these directions, it offers two new possibilities for the inclusion of REDD+ that can be explored:

- **Sector-based crediting** for REDD+ is the current favoured direction being negotiated under the UNFCCC (whereas projects have little support). Recently adopted and proposed carbon markets, as well as emerging pay-for-performance pilot programmes, have also showed a preference for sectoral REDD+, either on a national or large administrative unit scale, including California's cap-and-trade program, bilateral pay-for-performance deals (Norway and Guyana, Brazil and Indonesia) and the Forest Carbon Partnership Facility (with the membership of over 40 countries).

- **Sector-based trading** is unlikely; to date New Zealand is the only country that has put part of its forestry sector under a cap in its ETS. Other schemes either exclude the land-use sector completely, or integrate the land-use sector into their scheme only for offsets. This is primarily because forestry sector based trading is generally considered to be technically difficult to implement, requiring the regulation of a generally large number of non-standard non-point sources.[27] Developing countries are even less likely to take a sectoral trading approach, owing to capacity, technical and governance limitations. Most (but not all) forested developing nations are not considered emerging economies and many are LDCs.

24 UNFCCC decisions on REDD+ have focused on "national strategies or action plans, policies and measures" (decision 1/CP.13, para. 73) and national reference levels with subnational reference levels only as an interim measure (e.g. decision 12/CP.17, para. 11).

25 The VCS has allowed grouped projects, similar to the CDM's PoAs, and AFOLU projects are currently in the pipeline but not yet registered (personal communication).

26 Such a sectoral crediting mechanism is the preferred option of the EU for the NMM in the context of the UNFCCC negotiations. See the EU's submission to the AWG-LCA regarding views on the elaboration of market-based mechanisms, available at http://unfccc.int/resource/docs/2011/awglca14/eng/misc02.pdf.

27 See http://www.fas.org/sgp/crs/misc/RS22964.pdf.

4.7 Benefits and risks of including REDD+ in the CDM

REDD+ in the CDM may help to achieve several objectives, but there are associated risks

4.7.1 Benefits

There are several important direct benefits to the CDM of including REDD+ in the near and mid-terms. The most important benefits from the perspective of the CDM would be those that enable it to meet its primary objectives of assisting Parties in achieving sustainable development and contributing to climate change mitigation.[28]

To date the CDM has had mixed results in terms of generating **sustainable development benefits**; including REDD+ in the CDM may present an opportunity to improve this record and make major direct contributions to sustainable development. There have been many assessments of individual REDD+ programmes and projects that show evidence of such benefits, especially in the areas of forest governance and land-tenure reform, spatial planning, community forest management, maintenance of biodiversity and water provisioning, maintenance of soil fertility, stabilisation of local climates, improved resilience to natural disasters and climate change, generation of non-timber forest products, and improved incomes.[29] There are, however, also a large number of criticisms of REDD+ and concerns that it could lead to loss of rights and access to forests, and/or tenure claims by local or indigenous groups (Cotula & Mayers, 2009; Crippa & Gordon, 2012; Fenton, 2010).

Including REDD+ in the CDM may also present greater opportunities for investment in emission reductions and sustainable development in the LDCs, helping to **shift the distribution of CERs towards a more equitable balance**. Emissions from the forestry, agriculture and land-use sectors account for a relatively larger portion of mitigation potential for many LDCs than for wealthier developing countries (with the possible exception of Brazil and Indonesia) (FAO, 2010). These LDCs, such as the Democratic Republic of the Congo, Myanmar, Cambodia and Zambia, have not had the opportunity to engage in the CDM in any significant way to date,[30] owing in part to the lack of emission reduction potential in current sectors covered by the CDM and also to governance and implementation challenges. REDD+ may be one of the only ways for poor communities in these LDCs to participate in carbon markets and access finance that would give them the opportunity to conserve forests and achieve sustainable livelihoods.

REDD+ in the CDM could harness **cost-effective emission reductions** globally from a new and underutilised source. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change states that "forestry can make a very significant contribution to a low-cost global mitigation portfolio that provides synergies with adaptation and sustainable development".[31]

In addition to the direct near-term benefits for the CDM of including REDD+ as discussed above, there would also be a number of longer-term **learning-by-doing opportunities for the CDM**. REDD+ is likely to be an important element of any new climate agreement, including the one being discussed under the Durban Platform.[32] Including REDD+ in the CDM presents the opportunity, for the CDM and for the UNFCCC more broadly, to gain experience with REDD+, whatever its future form. Expanding in this direction could provide an opening for the CDM itself to meet future demand for REDD+ market mechanisms, reducing the need to build parallel crediting mechanisms.

4.7.2 Risks

One of the largest perceived risks to the CDM of including REDD+ is further **oversupply of credits and price collapse** (Michaelowa, 2012d). The perception of this risk, which is based on very high estimates of potential REDD+ credit supply using theoretical and biophysical approaches, can be diminished somewhat by contrasting these high estimates of supply against technical or feasible estimates and the current REDD+ pipeline. It is also notable that there

28 Article 12 of the Kyoto Protocol.

29 See, for example, "Biodiversity and Livelihoods REDD-plus Benefits", by the Secretariat of the Convention on Biological Diversity (CBD), available at http://www.cbd.int/doc/publications/for-redd-en.pdf.

30 For the CERs issued, by country, see cdm.unfccc.int.

31 See http://ipcc.ch/publications_and_data/ar4/wg3/en/ch9s9-es.html.

32 See, for example, the following text from the Durban Platform: "Reaffirming the principles and provisions set forth in decision 1/CP.16 and appendices I and II on policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries".

were similar fears with regard to A/R credits – with a theoretical supply similar in magnitude to the theoretical REDD+ credit supply – but the feared oversupply never materialised. However, with the CDM's largest current challenge being that of balancing supply and demand in order to yield a functional market, this risk would need to be addressed, first and foremost, in any proposal for including REDD+ in the CDM. Design elements that could address this risk are discussed below.

If (more) non-additional crediting were to be allowed for REDD+ projects than for existing CDM project types, there is a risk that including REDD+ in the CDM could in fact increase **overall emissions**. This risk can be avoided or reduced by, for example, setting an appropriately conservative baseline against which crediting occurs and/or reducing the crediting baseline for some countries to take into account self-financed mitigation efforts. Mechanisms would also need to address the risk of reversals. If environmental integrity is not adequately maintained, it is likely that demand-side countries will limit or ban the use of REDD+ credits in their systems, foregoing the benefits identified above (Unger, Streck & Lee, 2012).

There are also **institutional risks to the CDM** of including REDD+. The institutional capacity of some elements of the CDM has been stretched thin, and some of the current proposals for a "reformed CDM" (Michaelowa, 2012c), such as the use of standardised baselines and benchmarks, would be unlikely to reduce the institutional demands placed on the CDM by REDD+. Even with unlimited capacity, there may be procedural risks involved in introducing REDD+ into the CDM. The procedures and rules of the CDM may not be sufficient or appropriate for sectoral REDD+, and opening these fundamentals up to debate or changes would require additional work that may take several years to complete.

Finally, there is also the risk that expanding the CDM to include REDD+ would **prejudge the outcomes of negotiations** on both REDD+ and non-REDD+ issues. For REDD+ there are many unresolved issues, such as scale thresholds and other technical issues. It may be difficult for the CDM to test REDD+ without taking controversial decisions. More broadly, the shape of a future sectoral mechanism also remains in question. For example, it could vary in terms of governance from centralised to decentralised. A sectoral mechanism within the CDM would be likely to be highly centralised and could be seen by proponents of a more decentralised sectoral crediting mechanism (such as California) as biasing future agreements (Sépibus & Tuerk, 2011) (though it should be noted that a decentralised approach is progressing under the NMM agenda of the Convention).

4.8 Mitigating risks and maximising benefits

Options exist for curbing the risks and maximising the benefits of including REDD+ in the CDM

The CDM could explore a range of options for eliminating or mitigating the potential risks of the inclusion of REDD+. Several are described below.

4.8.1 Limiting demand

To manage concerns about REDD+ credits flooding the market, the CDM could include strict quantitative limits on the number of REDD+ credits permitted to be used to meet Kyoto targets. Alternately, safety-valve mechanisms could be used that would allow the use of REDD+ credits if their prices were to rise above a certain threshold, or a carbon bank mechanism that includes a commitment to purchase REDD+ credits and put them in a credit bank that could be retired for additional emission reductions or released into the market if prices were to rise excessively. A discounting mechanism that converts REDD+ credits into CERs at a fixed or adjustable discount, based on price or other factors, could also be considered. Notably, several of these mechanisms could also mitigate the risks of non-additionality or reversal of REDD+ credits. For example, discounting would provide an implicit buffer pool against both, while a credit bank would provide a time lag between the purchase and use for compliance of credits, which could protect against the risk of reversal to a degree, as well as against the chance that the price triggers are never reached.

4.8.2 Limiting scope

The CDM could choose to experiment with REDD+ by expanding to include only a subset of forestry sector activities. Reducing emissions from deforestation (RED) and/or forest management could be allowed as a starting point. The inclusion of other categories of activities, such as forest degradation, could be delayed until the ability to accurately measure the GHG emissions

from such activities improves. Allowing the inclusion of deforestation first would also reflect the original accounting rules for Annex B countries under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, which require Annex B countries to account for afforestation, reforestation and deforestation, while leaving accounting for forest management optional.

4.8.3 Piloting various options

To avoid prejudging the outcomes of the relevant negotiations, the CDM could establish multiple pathways for REDD+ along critical dimensions such as scale. CDM host countries could choose whether their DNA would certify project-based REDD+, sector-based REDD+ or some combination. Sectoral REDD+ could be pursued on the national or subnational scale. Demand-side countries could similarly choose, as they do now, to accept or not to accept specific categories of CERs verified to one or another methodology.

4.8.4 Maximising sustainable development benefits

Concerns that the large-scale implementation of REDD+ could lead to loss of biodiversity or tenure and other rights of local stakeholders are real and cannot be ignored. In order to maximise the sustainable development benefits arising from REDD+, eligibility requirements to ensure that REDD+ projects deliver such sustainable development benefits would be required, including sound institutional foundations, strong forest governance, and robust environmental and social safeguards.[33] To increase the sustainable development benefits brought about by REDD+ under the CDM, the CDM could consider supplementing the current method of certification by DNAs with additional national- or subnational-level prerequisites or minimum criteria for participation.

Table 9 summarises the comparative benefits, challenges and risks of the two primary design options for including REDD+ in CDM: project-by-project REDD+ and sectoral REDD+ crediting.

4.9 Conclusion: options for including REDD+ in the CDM

Four options have been identified

Based on our research and analysis, we suggest that the High-Level Panel consider the following four options for including REDD+ in the CDM, within the context of reforming the CDM, offering opportunities for learning-by-doing and considering the benefits and risks of expanding the CDM. Each scenario would require the design elements of the inclusion to be considered so as to minimise risks and maximise benefits. For all scenarios, a similar set of design elements, such as employing quantitative limits and requiring strong environmental and social safeguard systems, would be required.

4.9.1 The Status quo: exclude REDD+ from the CDM

First, and most obviously, the High-Level Panel could recommend that the CDM maintain the status quo on REDD+. This path of least resistance would have the benefit of avoiding the downside risks to the CDM of:

- Increased supply of credits and further decreases in the price of CERs;
- Emission reductions that may be (or at least may be perceived to be) less than fully additional;
- Causing a loss of the land or forest rights of local communities or indigenous groups;
- Stretching the CDM's institutional capacity or requiring broader changes to the CDM procedures;
- Taking decisions on REDD+ that could prejudge the outcome of the negotiations on REDD+ or on NMMs more broadly.

But potential benefits of REDD+ would then be foregone, losing the opportunity to:

- Increase contributions to sustainable development and reduction of deforestation in countries and sectors not currently engaged in the CDM in a significant way;

33 See, for example, Katerere Y (2012). "REDD+ Lessons for Sustainable Development", in G8: Climate Change – The New Economy, available at http://www.climatechange-theneweconomy.com/; and CBD Secretariat and giz (2011) "Biodiversity and Livelihoods: REDD-plus Benefits", available at http://www.cbd.int/doc/publications/for-redd-en.pdf.

- Deliver additional climate change mitigation through cost-effective emission reductions;
- Contribute to global learning-by-doing for both REDD+ and the CDM;
- Prepare the CDM for a possible role in a future Durban Framework agreement by linking it with REDD+;
- Contribute to a consolidation of the currently fractured REDD+ crediting landscape, increasing the efficiency of the entire REDD+ endeavour;
- Speed up capacity-building for REDD+ in the forestry sectors of developing countries.

This option (i.e. that the CDM maintain its current acceptance of project-level A/R only and exclude other REDD+ activities or options) would convey a lack of confidence in the long-term potential scope and impact of the CDM, as well as a lack of vision for the CDM in terms of it providing an innovative laboratory for market-based climate change mitigation, and, most importantly, would mean foregoing important opportunities for the CDM to meet its core objectives of sustainable development and (cost-effective) mitigation.

4.9.2 Expand the project-based CDM to include additional REDD+ activities

The second option is for the High-Level Panel to recommend that the CDM expand project eligibility to new types of projects in the forestry sector beyond the currently allowed A/R projects. The benefits of this would be:

- Increased opportunity for the CDM to generate sustainable development benefits;
- Increased engagement of developing countries, particularly the LDCs, in reducing emissions;
- Additional cost-effective climate change mitigation opportunities, possibly increasing ambition;
- Learning-by-doing for the CDM in executing RED under the UNFCCC;
- Contributing to learning-by-doing through increased actions, and possibly some reduction in the fragmentation of project-based REDD+ methodologies;
- Maintaining existing CDM processes and institutions.

Even if the design elements detailed above were to be incorporated, expanding the CDM to include additional project-based REDD+ activities would expose the CDM and REDD+ to risks, including the risks of:

- Issuing credits that may not be perceived as credible owing to the risk of leakage;
- Causing a loss of the land or forest rights of local communities or indigenous groups if appropriate safeguards are not in place or enforced;
- Requiring changes to how permanence is addressed, which may put additional institutional demands on the CDM;
- Prejudging the outcome of the negotiations on REDD+ in favour of a project-based approach.

4.9.3 Piloting sectoral RED on the national or interim subnational scale

Sectoral trading is not likely for REDD+, meaning that sectoral crediting is the likely future under any scenario. However, there are technical, data and capacity challenges for most countries to participate in a full sectoral crediting mechanism that requires the MRV of all forestry activities/categories. That said, many countries are building monitoring systems that, as a first step, will enable them to measure national and/or subnational deforestation at scale. In this regard, many countries are interested in simply reducing emissions from deforestation or participating in an early RED mechanism, with the option to expand into other forest-related activities later as their ability to measure forest degradation and regrowth improves.

The benefits of the inclusion of sector-based RED in the CDM would be similar to those of the second option above and include:

- Increased opportunity for the CDM to generate sustainable development benefits;
- Increased engagement of developing countries, particularly forested countries with a higher level of development and stronger governance, in reducing emissions.

- Additional cost-effective climate change mitigation opportunities, possibly increasing ambition.
- Learning-by-doing for the CDM, in testing methods for REDD+ in particular and in sectoral crediting in general.

However, opening up the CDM to sectoral RED would expose the CDM and REDD+ to risks, including the risks of:

- Causing a loss of the land or forest rights of local communities or indigenous groups if appropriate safeguards are not in place or enforced;
- Requiring changes to how permanence is addressed, which may put additional institutional demands on the CDM;
- Requiring substantial new CDM processes, possibly overwhelming the CDM institutions;
- Excluding LDCs that may be able to participate at the project level but not on a national or large subnational scale.

4.9.4 Pilot sectoral RED and allow new project types in the context of a national or interim subnational REDD+ framework

This final option combines the second and third options detailed above but with some modifications to allow for the piloting of national or interim subnational sectoral RED, while also allowing new REDD+ project types, but only in the context of a national or interim subnational REDD+ framework. Projects would be allowed only if a national monitoring system and appropriate institutional frameworks were in place, and if projects were 'nested' within national or interim subnational-level accounting and reporting systems. Such an approach, if subject to the design elements enumerated below, would:

- Reduce the risk of prejudging the outcome of the relevant negotiations;
- Provide the maximum benefits and other learning-by-doing opportunities for both the CDM and REDD+;
- Minimise risks, as long as demand is controlled and/or quantitative limitations are put in place and strong safeguards are pursued and enforced.

In the case of all of the options for expanding the CDM to include REDD+, we also recommend the incorporation of the following **design elements**, in order to manage and mitigate risks and maximise benefits:

- Limit demand for the new activities, in order to manage potential market flooding, using a quantitative limit or other mechanisms;
- Limit the initial scope, with the option of phasing in other activities, such as reducing emissions from forest degradation or conservation of forest carbon stocks, that involve more complex technical requirements at a later stage;
- Require strong social and environmental safeguards, guided by agreements made under the UNFCCC;
- Require a buffer reserve, insurance or another mechanism to protect against reversals;
- Supplement current DNA approval procedures with additional criteria to ensure that projects generate sustainable development benefits, along with options for third-party review and verification;
- Provide guidance to ensure that crediting baselines are conservative and credible, in order to reduce, as practicable, the occurrence of any non-additional emission reductions; and
- Limit projects to those of a large scale only, based on a minimum areal extent.

Table 9. Summary of the benefits, challenges and risks brought about by the key design options for including REDD+ in the CDM

Option	Status quo: exclude REDD+ from the CDM	Expand the project-based CDM to include additional REDD+ activities	Pilot sectoral RED on a national or subnational scale	Pilot sectoral RED and allow projects in the context of national or subnational systems	Brief explanation
Meets the objectives of the CDM					
Promotes sustainable development	🔴	🟠	🟢	🟢	Projects promote sustainable development in limited geographical areas, while sectoral crediting on larger scales promotes improved governance, policies and practices in the forestry sector more broadly. The combination can achieve both, according to host-country capacity.
Delivers additional climate change mitigation	🔴	🟠	🟢	🟢	Additional mitigation potential is possible with REDD+, but sectoral crediting is expected to generate larger volumes if implemented successfully.
Harnesses cost-effective emission reductions	🟠	🟢	🟢	🟢	Both sector- and project-based REDD+ would be expected to generate low-cost emission reductions.
Maximises the participation of developing countries	🟠	🟠	🟠	🟢	Project-based REDD+ would maximise the participation of the LDCs; sectoral crediting would maximise the participation of wealthier developing countries; the combination could achieve both.
Creates risk of disenfranchising indigenous peoples or local communities	🟢	🟠	🟠	🟠	Existing decisions of the COP reduce risk, which can be further reduced by providing appropriate guidance on safeguards, including implementation, reporting and verification.
Creates risk of a negative impact on biodiversity	🟢	🟠	🟠	🟠	Existing decisions of the COP reduce risk, which can be further reduced by providing appropriate guidance on safeguards, including implementation, reporting and verification.
Learning-by-doing for the CDM					
Builds knowledge on and capacity for REDD+ in the UNFCCC context	🔴	🟢	🟢	🟢	Both project- and sector-based REDD+ would provide new learning-by-doing opportunities for the CDM in terms of forestry sector MRV, safeguards, reference levels and addressing the risk of reversals.
Prepares the CDM for a role in NMMs under the UNFCCC	🟠	🔴	🟢	🟢	REDD+ may be the best option for a new sectoral CDM mechanism. Sectoral crediting would require new approaches to setting reference (emission) levels that would involve host-country governments. The combination could provide this benefit with less risk than pursuing sectoral crediting alone.
Avoids risks to the CDM					
Limits increase in CER supply	🟢	🟠	🟠	🟠	Including any REDD+ in the CDM could exacerbate the problem of oversupply. Mechanisms to limit demand could be applied to project- or sector-based REDD+ or the combination.

Option	Status quo: exclude REDD+ from the CDM	Expand the project-based CDM to include additional REDD+ activities	Pilot sectoral RED on a national or subnational scale	Pilot sectoral RED and allow projects in the context of national or subnational systems	Brief explanation
Minimises institutional demands on the CDM	🟢	🟠	🔴	🔴	Moving from temporary crediting to another approach would create additional institutional demand on the CDM. The CDM could start allowing REDD+ projects using its existing project cycle and institutions, mutatis mutandis. Sectoral crediting for REDD+ may require substantial changes to basic institutions and processes. Pursuing both options would increase institutional demands beyond what either option alone would do.
Limits risk of environmentally questionable or non-additional CERs entering the market	🟢	🔴	🟠	🟠	Environmental integrity related risks are generally considered higher for leakage on the project scale, but baseline setting on larger scales can also involve risks.
Learning-by-doing and other benefits for REDD+					
Increases demand for REDD+	🔴	🟠	🟢	🟢	Allowing REDD+ into the CDM may create new demand for REDD+; in general sectoral REDD+ may see broader acceptance.
Consolidates fractured REDD+ market	🔴	🟢	🟢	🟢	Any option for expansion could allow CDM REDD+ methodologies to become a benchmark for REDD+.
Does not prejudge outcome of relevant negotiations	🟢	🟠	🟠	🟢	Pursuing only project-based or only sector-based REDD+ in the CDM would be likely to be seen as prejudging the outcome of the relevant negotiations; allowing both could minimise impact. Some decisions on critical open issues might need to be taken regardless.
Extends REDD+ experience beyond existing mechanisms	🔴	🟠	🟢	🟢	Project-based REDD+ in the CDM would provide a new interface for market-based REDD+ in the UNFCCC context. Sectoral REDD+ in the CDM would achieve this and more, including negotiation RELs/RLs with governments in a multilateral context.
Speeds up developing-country capacity-building	🔴	🟠	🟢	🟠	Governments would have more incentive to pursue REDD+ capacity-building and forestry-sector governance efforts under a sectoral approach. Allowing countries to choose project-based REDD+ instead could reduce this benefit.

Sources: Climate Focus and Climate Advisers.

Note: 🟢 = low risk and/or high benefit; 🟠 = medium risk and/or medium benefit; 🔴 = high risk and/or low benefit.

5. Sectoral mechanisms

Sectoral approaches and the CDM

Chapter contents

Sectoral mitigation may be of strategic importance in the future climate policy architecture and may have a direct impact on the development of the CDM

Sectoral mechanisms offer a means of scaling up the supply of offsets beyond what is possible through existing measures. For this reason, among others, sectoral approaches could play a strategic role in the future carbon market architecture, enabling greater emission reduction commitments to be made in developed countries and aiding the transition to ETSs where the requisite infrastructure is currently lacking. Their introduction would also, however, have a range of effects on the functioning of CDM markets and the incentives given to private entities, all of which must be duly considered. What can be said with relative certainty is that whatever role sectoral mechanisms assume, their development, or lack thereof, will have direct implications for the future of the CDM and should thus be of great interest to CDM stakeholders.

"The development of sectoral mechanisms has become increasingly relevant to the CDM."

5.1 Introduction to sectoral mechanisms

Sectoral mechanisms could facilitate an expansion in the supply of offsets and a shift towards a net reduction in emissions

Sectoral mechanisms centre on the idea that sectors may be credited for the mitigation that they take action to achieve and offer the prospect of a scale of offset generation that would be hard to achieve by means of a project-by-project mechanism. For this reason, among others, sectoral approaches have become a focus of the discussions regarding the future climate policy architecture, in which it is believed that they may play a strategic role.

This has been seen in UNFCCC negotiations, in which sectoral mechanisms have been proposed as one option for the implementation of an NMM, though the suggestion has been contentious. While many countries feel that sectoral mechanisms should be adopted on the grounds of their scale and perceived advantages, others believe that there is no role for such a mechanism at present, owing to considerations such as a lack of demand for credits and a desire to ultimately expand the current CDM system.

Among the countries that would like to see a sectoral NMM, there is not yet agreement on how one should be implemented. One proposal that has been advanced suggests that it should be done by expanding the CDM, a change that would have implications for the operation of the existing CDM and for the CDM market more generally. Even if a new sectoral mechanism was to be established outside of the UNFCCC, the role of the project-based CDM would be altered. For this reason, the development of negotiations on sectoral mechanisms has become increasingly relevant to CDM stakeholders and, in particular, to what role the CDM and the UNFCCC will play in the context of the future global climate policy architecture.

5.1.1 The role of sectoral crediting in the future climate policy architecture

Sectoral approaches could play a number of roles in the future climate policy architecture. Depending on the position in the policy space, as presented in figure 2, that carbon markets end up occupying, the design of and requirements for sectoral approaches will vary. The role of sectoral mechanisms in the policy space is discussed further in section 5.6.

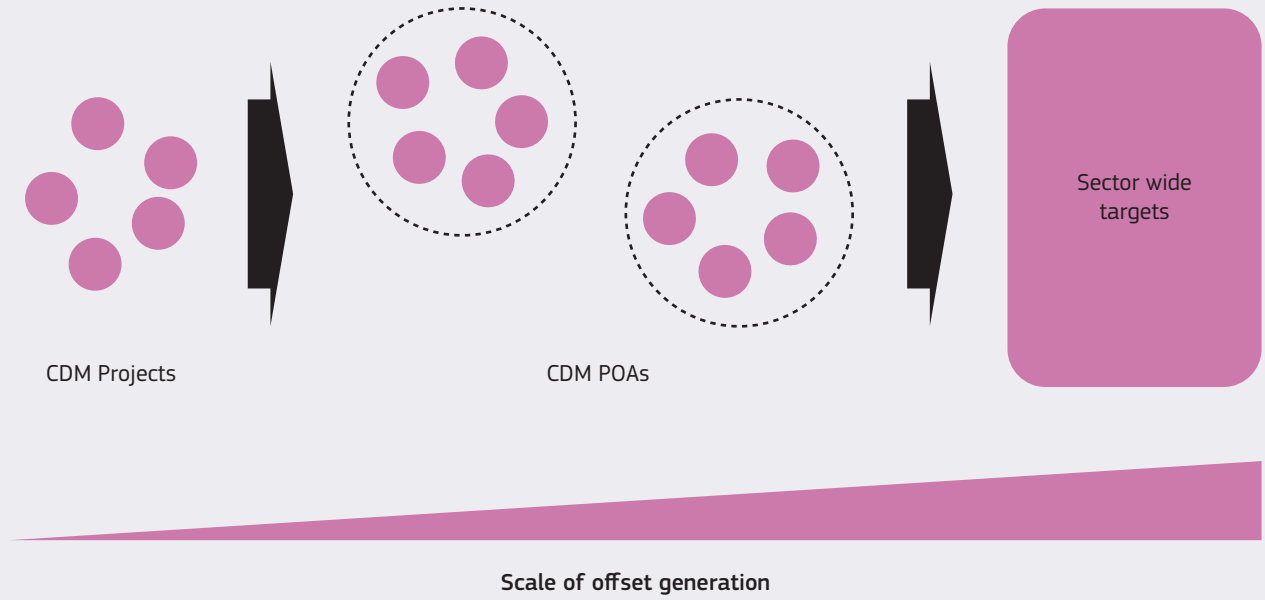
Where a sectoral mechanism is likely to prove most valuable is in the transition from the status quo towards a situation in which comprehensive global emission reduction targets exist, as that is where a larger scale of emission offsets would be required to satisfy increasing demand. This corresponds to an inner west position in the policy space. In the long term, as the scope of countries adopting targets becomes close to universal, then the role for any offsetting mechanism, including a sectoral crediting scheme, would diminish, as countries would be using mitigation to meet domestic targets and transfer of units between countries would likely be by means of IET. In a world of near-universal national-level targets, sectoral crediting may have a niche role in sectors where trading is not appropriate. As illustrated in figure 6, sectoral mechanisms compared with existing measures would enable the current level of supply of offsets to be increased beyond what is presently possible and would thus be strategic in accommodating the mid-term demand that would result from a more comprehensive adoption of targets.

If the scope of countries adopting commitments remains as it is today, then there is potentially a large role for offsets. Currently the role of offset supplier is played by the CDM, but it could be played by a sectoral mechanism in the future. This would be contingent upon the demand for offsets being large: in a situation in which the scope of countries adopting targets does not increase, it may be that the mitigation ambition of the countries which do have targets does not increase either. Many countries, such as Australia and those in the EU, have adopted unconditional targets (5% reduction in emissions compared with the level in 2000 and 20% reduction below the level in 1990, respectively), which will be increased only if there is more action by a broader range of countries (emission reductions of up to 25% and 30%, respectively) (UNFCCC, 2012). It is likely that the demand for offsets required to meet these unconditional targets can be met by the current project-based CDM (Michaelowa, 2012d).

For the same reason, sectoral mechanisms would have little role to play in a future climate policy architecture that was characterised by a shift away from comprehensive commitments to reducing emissions.

A further role for sectoral crediting may be to *induce* a movement towards a particular ultimate climate policy architecture rather than to *respond* to a predetermined direction. In this case it may be desirable to introduce a sectoral mechanism even if it is not required to meet demand.

Figure 6. Sectoral mechanisms allow for a greater scale of offsets to be generated than is possible through single projects or POAs under the existing CDM



Source: Vivid Economics.

There would be a relevant role for a sectoral mechanism under the following conditions:

- A sectoral mechanism would provide more effective learning-by-doing opportunities for domestic action than the project-based CDM;
- Receiving payment for projects under the CDM is an incentive against adopting domestic action in CDM host countries, which may be reduced or removed depending on the design of the sectoral mechanism;
- If the additional time and transition costs involved in developing a sectoral mechanism were not so high so as to outweigh the other benefits.

5.1.2 Definition of a sectoral mechanism

Despite the ambiguity that is often associated with the term, sectoral approaches, as they have been framed in the NMM debate, centre on the idea that a defined segment of a country's economy could be compensated for the mitigation that it takes action to achieve. Various methods for implementing such a scheme exist; however, most forms can be categorised as operating on either a crediting or trading basis. These two options are described more fully in section 5.1.3.

While the design of a sectoral mechanism may resemble the current architecture of the CDM, or even be incorporated within it, there are a number of ways in which sectoral mechanisms would differ fundamentally from the current project-based CDM:

- Firstly, a sectoral mechanism would go beyond single projects, or what is enabled through a PoA, by allowing abatement to be achieved through a range of activities that need not be individually identified;
- Emission reductions would be measured at an aggregate level as opposed to there being a single source of mitigation;
- Compensation would be paid to the government or sector administrator, not to the owners of the source of mitigation; it would then be at the discretion of the beneficiary as to how the compensation was distributed.

In the context of sectoral mechanisms, a 'sector' would be loosely defined and may refer to any grouping of emission sources that can be identified; such identification could be not only by the entities which fall within the grouping, but also by geographical scope or by the gases that are hoped to be abated. These broad criteria would allow for a wide range of projects to be pursued through sectoral approaches, including those driven by government-mandated policy, private-sector initiatives and NAMAs.

It should be noted that although initial UNFCCC discussions considered, for instance, transnational sectoral approaches which sought to ensure cross-border sectoral commitments, such considerations have subsequently disappeared from the UNFCCC negotiations (Marcu, 2012). For this reason, the following section will focus on sectoral mechanisms as per the specification provided above – where the initiative is restricted to the national level.

5.1.3 Sectoral crediting versus sectoral trading mechanisms

There are two broad ways in which a target or baseline under a sectoral mechanism can be achieved: through sectoral crediting or through sectoral trading.

The first mode of operation, sectoral crediting, compares a sector's achieved emission reductions against an ex ante agreed crediting threshold. If total emissions are below this baseline, credits will be issued to the sector though an agreed system of distribution and may then be sold on international markets. In most proposals, sectoral baselines are 'no-lose' targets, which means that if emissions are above the baseline, no penalty is paid (Baron, Buchner & Ellis, 2009). This is a similar mode of operation to the CDM, whereby units are issued if the project exceeds the emission reduction target, but there is no penalty otherwise. In this case, if the target is achieved it is likely to be through some form of government intervention or regulation, such as, for example, the imposition of energy efficiency standards. Whether or by how much the target is exceeded is uncertain at the beginning of the scheme as it is not possible to predict exactly how covered entities will respond to a particular policy; although an exception to this would be in cases where the government was able to directly control the operations of the covered entities, for example if they were state-owned enterprises.

Alternatively, under the second mode of operation, a sectoral mechanism may operate on a trading basis, whereby an ex ante agreed quantity of allowances would be distributed through trading within the sector itself. If an individual entity is able to use fewer allowances than it was initially allocated, it may sell its excess to the firms that exceeded their own allocation. In this case, the target is achieved by making the decision on the number of allowances to issue. There would need to be penalties for non-compliance in order for this mechanism to be effective, and the extent to which the target is exceeded would be determined ex ante by the determination of the cap.

A key advantage of trading over crediting is that it provides more incentive for private action. A problem with crediting is that it can distort market price incentives by requiring collective action to reduce emissions below the aggregate sector baseline. Private entities are less likely to reduce their emissions if they believe that the sector as a whole will fail to reach the sector's crediting threshold, resulting in no compensation being paid. Sectoral trading, however, addresses this problem by rewarding each entity in proportion to their contribution to emission reductions, regardless of how the sector performs as a whole. This ensures that private entities will abate emissions to the level determined by the initial allocation of allowances.

Despite this, sectoral crediting has generally been considered more politically feasible than trading as it imposes no monetary penalty on entities that fail to reduce their emissions below the agreed baseline and some countries view the adoption of any cap, even for a specific sector, to be counter to the principle of 'common but differentiated responsibilities'. Given the highly political environment in which sectoral projects would operate, it is imperative they are able to attract sufficient political support if emission reductions of any level are to be achieved.

5.2 Developments in negotiations on an NMM

While negotiations have made strong progress, a great deal of work remains

5.2.1 Current status of negotiations

In recent years, discussion surrounding the implementation of an NMM has gained momentum. The Bali Action Plan, agreed upon in 2009, laid out an initial road map for reaching a comprehensive decision on the matter, with the goal of detailing the direction and destination of the development of an NMM. To facilitate this process, Parties to the Convention established a new ad hoc working group to investigate long-term cooperative action (the AWG-LCA), which, under its agenda item 3(b)(v), has looked into "various approaches, including opportunities for using markets, to enhance the cost-effectiveness of, and to promote, mitigation actions, bearing in mind different circumstances of developed and developing countries".

Negotiations achieved a breakthrough at the Durban climate change conference in December 2011, where, after

years of paralysis, Parties agreed to define an NMM that would be used to meet emission reduction commitments under the Convention. Parties specified that the new mechanism would be guided by the seven issues specified in at the climate change conference in Cancun in December 2010 (see decision 1/CP.16, paragraphs 79–86), which, notably, include a net reduction in emissions and a goal to stimulate mitigation action across broad segments of economies. Specifically, it was agreed that the new mechanism would take into account:

- Ensuring the voluntary participation of Parties, supported by the promotion of fair and equitable access for all Parties;
- Complementing other means of support for NAMAs of developing country Parties;
- Stimulating mitigation action across broad segments of the economy;
- Safeguarding environmental integrity;
- Ensuring a net decrease in and/or avoidance of global GHG 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.

While no decision has yet been made on what form the NMM will assume, some Parties favour the introduction of a sectoral approach. As such, the AWG-LCA has investigated the use of both sectoral trading and sectoral crediting in the course of its research. Sectoral mechanisms were also a focus of discussions between Parties at the Durban climate change conference.

5.2.2 Parties' differing views on sectoral mechanisms

While contrasting opinions exist among Parties of the merit of sectoral approaches, those who have come out in support of the NMM being sectoral, such as the EU and Norway, have stated a variety of reasons for their position. The EU, for instance, has expressed the strong opinion that sectoral mechanisms will prove to be a fundamental component of the future climate policy architecture, by helping to facilitate the transition towards the universal adoption of emission reduction targets and the creation of a global carbon market. By developing the capability to report on and verify emissions, the EU believes that countries pursuing sectoral projects would acquire the necessary infrastructure to adopt concrete targets, one of the first steps in establishing a global market. The Centre for European Policy Studies argues that the establishment of sectoral benchmarks, in particular, would aid this transition by providing a means of setting a cap on GHG emissions and of allocating allowances, essential information for the architecture of an ETS (Fujiwara et al., 2010).

Other Parties have noted the minimisation of leakage in justifying their support for sectoral approaches. The ARB, while not formally involved in the UNFCCC negotiations, has argued that projects that encompass an entire sector minimise the ability for entities to reduce emissions at one source by increasing them at another, a criticism that has often been targeted at the CDM. Proponents of sectoral schemes claim that while leakage may still occur by means of vertical disintegration or outsourcing, the potential for leakage would be considerably reduced by sectoral, compared with individual, projects. This would help to ensure the environmental integrity of the offsets generated and their contribution to global mitigation, an issue that was one of the seven agreed upon at the climate change conference in Cancun. Concerns about leakage have often played a large part in motivating opposition to mitigation action in countries which currently have commitments and so overcoming this concern could be of value to the political feasibility of an NMM.

Further advantages of sectoral approaches that have been noted by some Parties include their ability to incentivise a larger absolute amount of emission reduction activities in the countries where they are applied than project-by-project approaches (Marcu, 2012). Some countries, such as China, are opposed to sectoral approaches and believe an NMM should be project-based. This is based on the consideration that developed countries should primarily undertake emission reductions domestically, with offsets playing only a supplementary role. China, along with other developing countries, is also strongly opposed to the placement of emission reduction targets on developing countries, a key feature of some proposals for sectoral approaches (SEA, 2012a).

On the other hand, and as noted above, sectoral crediting mechanisms (but not sectoral trading mechanisms) face a key challenge in terms of being able to incentivise action at the plant/firm level (Marcu, 2012). This has led a number of countries to express concerns about their relevance.

Sectoral trading mechanisms overcome this challenge but face greater political challenges as they would be less consistent with the existing distinction between Annex I and non-Annex I countries.

Table 10 provides a list of some of the key criteria that have been considered in the course of negotiations on an NMM and scores the performance of the different possible mechanisms.

Table 10. Performance of different mechanisms scored against some important criteria

Criterion	CDM	Sectoral crediting mechanism	Sectoral trading mechanism
Prevention of leakage	2	4	4
Incentivising private action	3	2	5
Political feasibility	4	3	2
Ability to scale up mitigation	2	4	4
Costeffectiveness	2	4	4

Source: Vivid Economics.

Note: 1 = very poor; 2 = poor; 3 = average; 4 = good; 5 = very good.

5.2.3 Most elements of the design of the NMM are not settled

In addition to the discussion on what form the NMM should take, many other design features of a future mechanism remain uncertain. One such feature is the governance structure, which, although it has been negotiated in relative depth, still cannot be predicted with certainty. The agreement reached at the climate change conference in Durban specified that the NMM is to be under the control and direction of the COP, which suggests that the proposed mechanism will be likely to have a top-down structure and, at this stage, be defined under the auspices of the UN (SEA, 2012b). It is thus a possibility that if an NMM is established it will have at least some centralised governance elements, in the sense that there would be at the very least some oversight role played by a central body in relation to the number and quality of any credits generated. This can be distinguished from a fully decentralised mechanism, such as that proposed by California, whereby the issuing of credits is determined by terms negotiated between the host and sponsor countries. The governance specifications will need to be further refined, however, before they are in an implementable state.

Negotiations on the governance of an NMM will therefore need to focus on what degree of centralisation the mechanism should have, or whether a hybrid structure would better suit the needs of stakeholders, as has been suggested by Japan. A centralised governance structure would be characterised by a centralised system for the verification and issuance of credits and the registration and approval of projects. By contrast, a hybrid scheme would allow for greater autonomy at the country level, by, for instance, relaxing the need for individual projects to be centrally approved or by allowing measurement and verification processes to be carried out by the host. Even in a very loosely defined hybrid governance structure, however, it is likely that the issuance of credits and the development of the mechanism itself would be under the control of a central body. A summary of the advantages and disadvantages that must be weighed up when making a decision on governance structure is presented in table 11. This discussion is particularly focused on the governance of the NMM (as the most likely institutional vehicle for realising a sectoral approach), but it is clearly closely related to the discussion on the governance of the CDM, as discussed in section 3.5.

Negotiation must now focus on the numerous elements of an NMM on which no agreement has been reached, but which are crucial for the development of a well-defined mechanism. Besides the majority of the technical elements, other features that will require considerable thought as negotiations develop are:

- The setting of baselines;
- Criteria for participation;
- Provisions for the issuance and tracking of credits;
- Guidelines to address double counting.

This will require a great deal of work, particularly the negotiation on baselines, which, given their direct correlation to the issuance of credits, have proven to be a highly political issue in the past.

Table 11. Both centralised and hybrid governance structures have advantages and disadvantages to their use

Centralised governance models		Hybrid governance models	
Advantages	**Disadvantages**	**Advantages**	**Disadvantages**
Could be embedded neatly into Kyoto Protocol rules	Complex process to set up; administrative burden if similar processes as under CDM	Bilateral agreements between Annex I and non-Annex I countries easier to establish	Difficult to compare targets and pledges
Would build upon past experience	Less flexibility to take specific host-country circumstances into account	Simplified MRV of emission reductions possible	Limited international trading if differences in units are too large
Easier to compare levels of ambition across baselines		Different approaches beyond CDM methodologies possible	Competition between systems may lead to a 'race to the bottom'
Commonly agreed unit makes establishing global market easier		Bilateral agreements better to accommodate host-country priorities	

Source: Vivid Economics.

Another important issue that will need to be resolved by the COP is whether conditions warrant the creation of an entirely new mechanism or if changes could be made to an existing mechanism. Several stakeholders have proposed that the CDM should be reformed into an NMM by allowing sectoral projects, rather than having competing mechanisms. Others, however, including the EU and Japan, feel that the CDM should adopt only a niche role that would facilitate the development of a new, larger-scale mechanism (SEA, 2012b).

The future of the negotiations on the introduction of an NMM is at this stage unclear. While it is generally agreed by Parties that an augmented role for market-based mechanisms is required, whether this will be achieved through the development of a new mechanism that might sit alongside the CDM or by reforming the existing mechanism is not yet known. Negotiations will recommence in August 2012 at the UNFCCC conference in Bangkok and will be followed up at the Doha climate change conference in December 2012.

5.3 Existing examples of sectoral mechanisms

There are currently no well-established sectoral mechanisms

The infancy of the discussions regarding sectoral approaches has meant that, to date, there are few examples of sectoral mechanisms in operation. Several mechanisms do exist, although they range in their development from being only proposals to being in the early stages of implementation.

5.3.1 Japanese BOCM

One such mechanism is the BOCM that is currently being developed by Japan. The BOCM is aimed at individual and sector-level projects which the CDM has failed to address. This includes those in sectors such as transport that have high mitigation potential or which are of strategic importance to the host country, yet have been unable to compete for finance with the likes of low-cost industrial gas projects.

The BOCM resembles the CDM in many aspects, although it differs in its structure of governance and criteria for eligibility. Specifically, the BOCM allows projects, which may be defined at a sectoral level, to be assessed by means of a positive list or benchmarking, as opposed to under the CDM where projects must meet strict additionality criteria. It is planned to be operated on a solely bilateral basis, though some kind of role for a centralised verification structure has been discussed.

While the mechanism is in its late stages of development, it is not yet fully in operation. The Japanese Government is currently in the process of tendering for suitable sectors and projects and has, since 2010, been holding feasibility studies in a multitude of countries. The next stage of the BOCM's development is the implementation of model projects for developing MRV technologies, with the goal of starting operations in 2013.

5.3.2 Sectoral mechanisms under the Californian cap-and-trade program

The Californian cap-and-trade program is another mechanism that is currently negotiating the use of sectoral offset projects to help meet the compliance obligations of its participants. While the rules are not yet in effect, in 2010 the ARB made amendments to allow for 8% of obligations to be met by offsets that may originate from sectoral projects.

With the changes, sectoral crediting programmes used to offset targets will be required to be approved by the ARB to ensure the integrity of the credits being issued. The approval process will provide a verification programme consistent with international standards, although the ARB will retain full oversight. In this respect, the proposed mechanism is entirely bilateral and envisions no role for external accreditation or verification.

5.3.3 Sectoral crediting under the current CDM

The CDM itself could also allow sectoral initiatives, though it is generally not recognised as having such an opportunity. While the mechanism was not intended to address sectoral projects, there are currently no technical boundaries that would prohibit them from being established within it. The lack of success of such initiatives, despite the attempts by some to establish sectoral methodologies, illustrates that, in practice, doing so has proven difficult.

For example, methodology 0159, which was submitted in support of an efficiency-testing, consumer-labelling and quality-assurance programme for air conditioners in Ghana, provides an insight into the potential for sectoral crediting under the CDM. The project, which resembles the type that could be expected under a sectoral mechanism, conformed to nearly all of the CDM project requirements, but was rejected due primarily to it being a government-mandated policy. This concerns the definition of additionality: the determination in the case of methodology 0159 implied that action was not considered additional if it was mandated by government action because, conditional on the policy being implemented, the project would go ahead anyway. It is, of course, possible that policy could be induced by the ability to generate credits under the CDM, but it is difficult to robustly establish a policy counterfactual. This is an issue that would need to be addressed if the current CDM were to be expanded to include a sectoral mechanism.

Similarly, methodology 302, submitted in support of a project targeting emission reduction in Ecuador's cement sector, again came close to being approved, but ultimately failed due to concerns that the benchmark was arbitrarily set. One of the methodology's key features was that it allowed activities combining a number of different emission reduction measures to be pursued within a single project, a feature characteristic of sectoral projects. Were the relevant components of the methodology to be amended, it is possible to see how this methodology would enable the cement sector, and thus sectoral projects more broadly, to be credited under the CDM.

These failed methodologies suggest that the use of various activities to mitigate emissions across a geographically diverse area need not disqualify a project from being credited through the CDM, which suggests that many sectoral projects may not face barriers to entering the mechanism at present. They also, however, show that, while flexible enough to accommodate certain projects, the CDM will be required to evolve if it hopes to be developed into a full-scale sectoral mechanism.

5.4 The relationship between the CDM and sectoral mechanisms

The CDM may be adjusted to operate as a sectoral mechanism

5.4.1 Sectoral mechanisms under the current CDM

One option for the establishment of a sectoral mechanism is to implement it through an expansion of the CDM. This would allow it to be supported by a pre-existing framework and would facilitate a learning-by-doing approach to introducing sectoral projects. While much of the CDM could remain unchanged, certain aspects of the mechanism would be required to evolve in order to fully accommodate the introduction of sector-wide projects.

An advantage of embedding a sectoral approach within the CDM is that, as discussed above, much of the mechanism

already accommodates sectoral projects. Were the CDM to shift towards sectoral crediting, many elements would thus require little or no change. Elements such as the project cycle could be readily adopted by sectoral projects, along with the requirement to achieve emission reductions that are real, measurable and verifiable.

Some elements of the CDM, however, are less compatible with sectoral projects and would thus be required to evolve. The most important of these are summarised in table 12.

The first relates to the concept of additionality, which could be expected to create complications were it to remain in its current state. The concept has been a contentious issue in the CDM since its creation, with many projects arising that have generated debate over what may count as abatement that is genuinely 'additional'. This has been particularly discussed in relation to mitigation action taken in response to a government mandate. Under a strict interpretation of additionality, such emission reductions would be rendered non-additional, as if they were enforced by government policy, then it may be argued that they would have happened regardless of CDM intervention (Samaniego & Figueres, 2002). This definition of additionality would not be suitable for sectoral projects. While sectoral activities may still be led by private initiatives, it would be typical that the impetus for mitigation would stem from government-enforced policies, such as pursuing goals of environmental protection or economic development. It may even be that a piece of government policy itself forms the basis for a sectoral initiative. For this reason the requirement of additionality would need to be flexible enough to accommodate sectoral projects, perhaps even to the extent of recognising that the basis of additionality may, for some projects, be found in their contribution to sustainable development.

The setting of baselines is another area of the CDM that would be likely to need development before the CDM could be extended to include sectoral projects. Currently the CDM has several methods that may be used for the establishment of a project baseline, all of which, however, assume a single specific project (Samaniego & Figueres, 2002). This would not be appropriate for estimating the size of a sectoral mitigation initiative, whereby emission reductions may be achieved through a range of activities across a sector or region. A sectoral CDM would need to address this by establishing baselines founded on the historical emission level or future trajectory of the project boundary, be it sectoral or regional, prior to the implementation of the relevant technology or measure. To accurately capture this trend it is likely that some cases would require the use of multiple baselines, particularly if sectors were defined across more than one region or engaged in activities with varying degrees of emission intensity (Schneider & Cames, 2009). Multiple baselines would ensure that each component of the emission reductions within a sectoral initiative would be correctly compensated with regard to its specific counterfactual. While this may introduce new complications for the approval of baseline methodologies and would require further work, it would also help to reduce the potential for leakage, where emission reductions in one area of a sector are achieved at the expense of emission increases in another.

Table 12. Several components of the existing CDM would be required to evolve if it were to incorporate sectoral projects

Advantages	Disadvantages	Advantages	Disadvantages
Additionality	Need to demonstrate project would not go ahead without the CDM	Sectoral initiatives likely to only take place in response to government policy	Adjust definition of additionality to allow for government-mandated emission reductions to be accepted
Baseline	Project-based	Sectoral or regional	Facilitate use of multiple baselines and establish procedures for setting baselines across sector/region instead of for an individual source
Approval of methodologies	Desk review by Methodologies Panel, guided by previous applications	Large information asymmetries between Methodologies Panel and project administrators; few previous applications to guide decisions; highly political environment	Greater level of consultation required; more systematic process of review needed compared with current requirement of completing one only at request of three EB members
Project boundary	Single project	Sector or region	Definition of project boundary will need to change so as to allow for projects to be defined by total emissions as opposed to emissions from an individual source

Sources: Vivid Economics; Schneider & Cames (2009); Sépibus & Tuerk (2011).

The size of sectoral projects and the importance of the baseline in determining the allocation of CERs may additionally justify the tightening of procedures for the approval of baseline and monitoring methodologies. Sépibus and Tuerk (2011) note that the information asymmetries faced by the Methodologies Panel, which is tasked with the approval of project baselines and methodologies, are likely to be compounded when evaluating baselines at a sectoral level. In addition, the disadvantage at which they are placed by lacking knowledge of the economic and social conditions in the host country is likely to be considerably more pronounced when evaluating sectoral, as opposed to individual, projects. With the intense political environment in which sectoral projects are being negotiated and the strong incentives for governments to inflate their projects' baselines, the CDM framework, as it currently stands, may not provide an appropriately rigorous assessment of their credibility. In the light of these challenges, Sépibus and Tuerk (2011) propose that the Methodologies Panel complement its current desk review by an in-country assessment of local conditions, interactive meetings with the host country's government and consultation of other relevant stakeholders such as competitors and non-governmental organisations. Likewise, a more systematic review of baseline methodologies might be justified, as opposed to the current requirement to conduct one only at the request of three EB members (Sépibus & Tuerk, 2011).

The CDM would also be required to evolve its definition of project boundaries. Current CDM policy stipulates no concrete guidelines on what constitutes a project boundary. However, there is a general assumption that the CDM will accept only single specific projects (Samaniego & Figueres, 2002) or a grouping of those that are similar enough to be registered as a PoA. Such a concept would not be suitable for sectoral projects as it is not always possible to draw boundaries around each individual source of mitigation action. Under a sectoral mechanism, the project would be required to be defined across an entire sector or region, which would typically be specified at a national level.

5.4.2 Sectoral mechanisms alongside the project-based CDM

One of the difficulties that sectoral projects create is the potential for multiple projects to exist in the same area. The CDM specifies that project boundaries must encompass only the emissions that are significant and reasonably attributable to the project in question (UNFCCC, 2011b); thus the risk of double counting will need to be addressed were sectoral and single CDM projects to be pursued simultaneously. This will be particularly important in cases where pre-existing CDM activities are operating within the boundary of new sectoral projects. However, as was shown through the introduction of the CDM and JI, this issue can be overcome through the introduction of detailed accounting procedures. If a sectoral mechanism is established, then no new units from the project-based CDM should be issued for covered entities. Where there are pre-existing individual CDM projects, then the baseline for the sector should be adjusted to exclude the emission reductions generated by those projects.

5.5 Sectoral CERs and CDM markets

The introduction of sectoral projects will have a range of effects on CDM markets

The introduction of issuing sectoral projects with CERs, as has been proposed by some, would have a diverse array of effects on CDM markets. As has generally been perceived as one of the key motivations for sectoral mechanisms, their introduction would bring about a substantial upscaling of the potential offset supply. Thus a focus of the debate on the NMM has been on whether CDM markets would be capable of absorbing the influx of sectoral CERs, without adversely affecting prices or other market factors.

The key driver of a sectoral mechanism's impact is likely to be the magnitude of CERs (or other offsets) issued to sectoral projects, a factor around which there is great uncertainty. Depending on the design that a sectoral mechanism assumes and the enthusiasm with which it is received, the number of CERs that will flow into CDM markets could vary greatly. Design features including, inter alia, the agreed methodology for sectoral baseline setting, restrictions on participation and the definition of sectoral project boundaries will all have a direct bearing on the supply of CERs from any particular project. Furthermore, it is not yet known how many countries would make use of a sectoral CDM and, of those that would, the extent to which they would be able to reduce emissions beneath their agreed crediting thresholds. In the light of these uncertainties, it is difficult to provide specific estimates of the effects that a sectoral mechanism may have.

5.5.1 Potential scale of sectoral offsets

Estimates point to a large potential for sectoral mitigation. As can be seen in table 13, Schmidt (2008) estimates that 1,170 million tonnes of carbon dioxide equivalent ($MtCO_2e$) annual abatement could be achieved in the power sectors of the major developing-country emitters alone, while the International Energy Agency (IEA) predicts that 560 $MtCO_2e$ could be collectively abated in the cement sectors of China, Mexico and Brazil (Baron et al., 2009). In comparison, the CDM has issued approximately 950 million CERs to date (equivalent to 950 $MtCO_2e$); hence the annual abatement that might be achievable under sectoral mechanisms is greater than the cumulative abatement achieved by the CDM to date. This illustrates the enormity of the supply of offsets that sectoral projects may harbour (IGES, 2012). Even if only a small fraction of the potential abatement was achieved, sectoral projects would fundamentally alter the scale of the supply of offsets in CDM markets.

5.5.2 Current status of CDM markets

A narrow margin of excess supply currently exists for global offsets at current prices, and forecasts indicate that this is unlikely to change in the near future. For the period 2008–2012, the international carbon market (comprising CERs, ERUs, AAUs and RMUs) has been oversupplied by 290 million units (World Bank, 2012). Looking ahead, most scenarios suggest that this is unlikely to change in the period up to 2020 and predict that the level of excess supply may even increase. Based on the scenarios provided by Michaelowa (2012c), figure 7 and figure 8 show that supply of offsets is likely to exceed demand in most plausible scenarios in the short and medium terms. In fact, there would be a shortage of supply only in the case that the high-demand scenario was realised. The most likely demand scenario is the low or standard scenario, while the most likely supply scenario is the moderate or high scenario (Michaelowa, 2012c). With this in mind, excess supply is likely to be between 2,400 $MtCO_2e$ and 3,000 $MtCO_2e$ for the period 2013–2015 and between 7,700 $MtCO_2e$ and 20,800 $MtCO_2e$ for the period 2015–2020. Hence, there appears to be little need for supply beyond what is currently forecast, unless for reasons other than satisfying demand. This analysis is consistent with the current price of CERs, which, as shown in figure 9, are trading at historical lows.

A more detailed analysis of the offset demand and supply forecasts and the underlying assumptions is provided in Axel Michaelowa's report, "Scenarios for the global carbon markets", prepared for the High-Level Panel on the CDM Policy Dialogue.

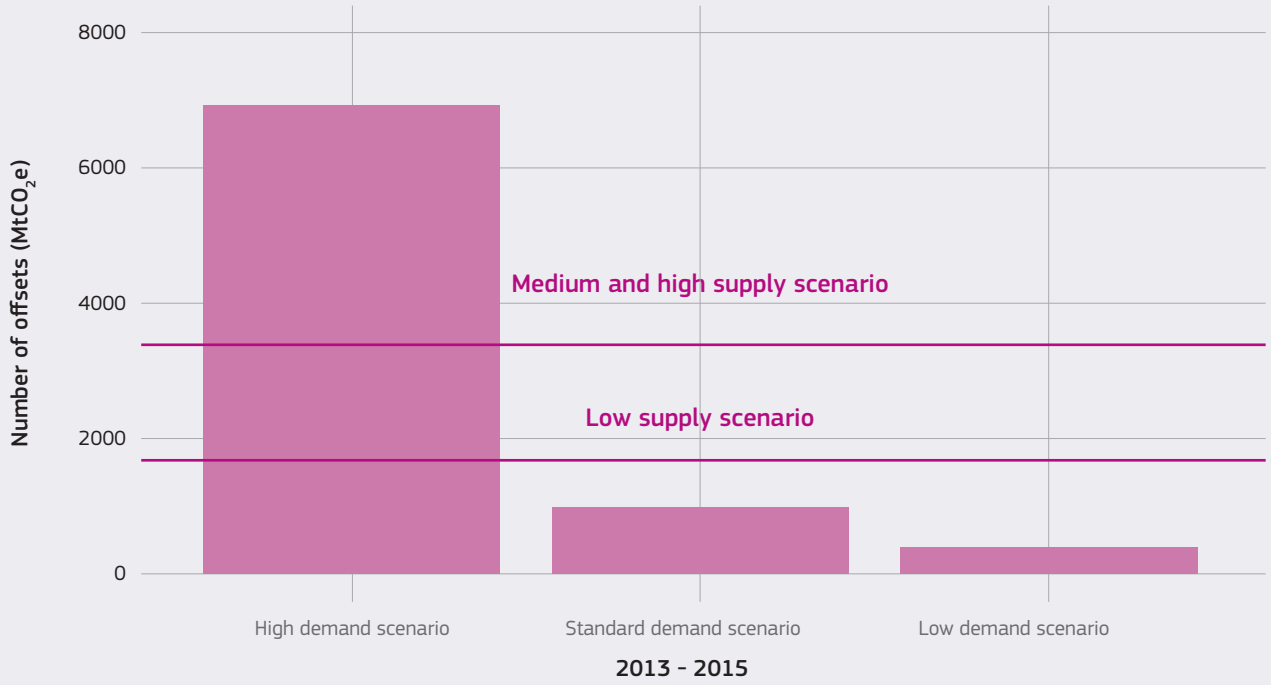
Table 13. Annual mitigation or crediting potential during 2013–2020 for selected sectors (in MtCO2e)

Source	Regional focus	Power sector	Cement sector	Forestry sector
IEA (2008)	Major emerging economies	4,652	–	–
Amatayakul et al. (2008)	China, India, South Africa, South Korea, Mexico, Indonesia and Thailand	110–560	–	–
GWEC (2008)	China	154–767	–	–
Schmidt et al. (2008)	Major developing-country emitters	1,170 (estimate)	450	
CCAP et al. (2008)	China, Mexico and Brazil	–	4,605	–
IEA (2008)	China, Mexico and Brazil	–	560	–
Ecofys (2008)	China, Mexico and Brazil	–	720	–
NF International (2008)	Developing countries	–	–	1,350
New Carbon Finance (2009)	Developing countries	–	–	1,400

Sources: Vivid Economics; Baron et al. (2009).

Notes: These estimates are drawn from different studies and have been made on varying assumptions. Emerging economies include China, Russia, India, Iran, Saudi Arabia, Indonesia, Brazil and South Africa. The IEA's estimate of mitigation potential in the power sector accounts for a 40% energy efficiency improvement, which represents all mitigation generated as a result of fuel-mix changes, not from lower levels of demand. Estimates made for the cement sector represent mitigation potential for 2020 only. CCAP et al.'s estimates assume the most advanced 'no-lose' targets based on current best practice or best available technologies.

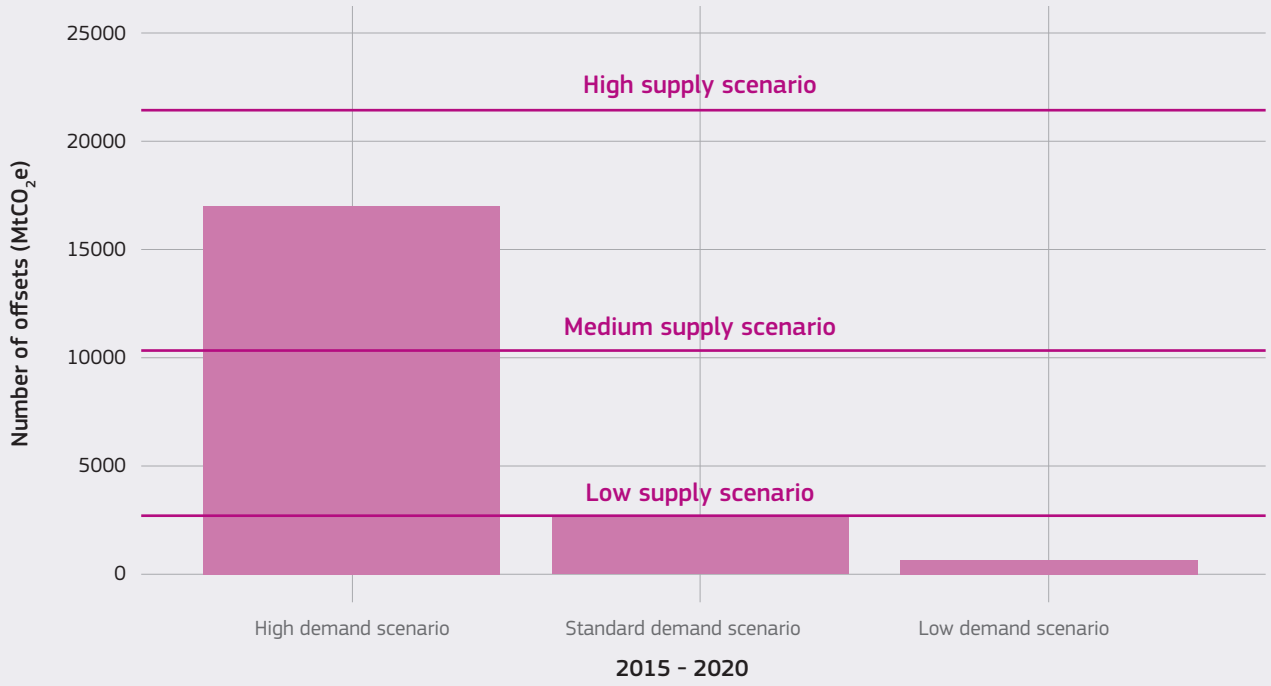
Figure 7. Forecast scenarios of the supply of and demand for offsets in CDM markets for the period 2013–2015 suggest that there is little need for additional supply



Sources: Vivid Economics; Michaelowa (2012c).

Note: Scale differs between figure 7 and figure 8.

Figure 8. Forecast scenarios for the supply of and demand for offsets in CDM markets for the period 2015–2020 suggest that there is little need for additional supply



Sources: Vivid Economics; Michaelowa (2012c).

Note: Scale differs between figure 7 and figure 8.

5.5.3 CERs

With the CDM market already likely to be characterised by excess offset supply over the coming decade, an influx of sectoral credits to the level suggested possible by Schmidt (2008) and the IEA (2008) would thus have a significant impact on the price of CDM offsets. This conclusion is supported by the historical behaviour of CDM markets, which, as is illustrated in figure 9, have exhibited a downward trend in prices as the cumulative number of CERs has grown – a trend that has been intensified by the race of projects to be established before the EU's 2012 deadline for the acceptance of non-LDC CDM projects. This has led to a situation in which the EU's demand for CERs is likely to be exhausted in the short to medium term, given the rules limiting the use of CERs by EU ETS installations (Bellassen, Stephan & Leguet, 2012). To date there has been little sign of a demand-side response to the low CER prices, neither through a relaxation of the EU ETS rules on CER use (for a given level of emission reduction ambition) nor through the EU or other countries increasing their emission reduction ambitions.

While the existence of low CER prices is not intrinsically problematic, it does have implications for the operation of the CDM and carbon markets more generally and these need to be considered. Of interest in terms of the mechanism's goals is the fact that a lower CER price may crowd out CDM projects with higher marginal abatement costs, many of which are often associated with higher returns in terms of sustainable development. This has already been seen in the CDM, where low-cost synthetic gas projects have dominated the number of CERs issued, while projects in more costly sectors, such as transport, have been comparatively scarce (Sépibus & Tuerk, 2011). A further challenge posed by low CER prices is that they may make it more likely that the projects that go ahead are less likely to be genuinely additional.

Figure 9. The price of CERs has exhibited a downward trend as the cumulative number of units issued has grown; this may highlight that demand has failed to respond to the increasing availability of offsets

Sources: Vivid Economics; BlueNext (2012); IGES (2012).

Note: Based on daily average BlueNext CER spot price.

5.5.4 Market liquidity and volatility

Sectoral mechanisms may also have an impact on the liquidity and volatility of CDM markets. In the event that the size and number of projects grows as a result of the inclusion of sectoral activities, as has been predicted, the depth of CDM markets would increase. Higher volumes of supplied CERs would enlarge the pool of available units, helping to smooth the impact of market transactions and improve the stability of market prices. This would be a welcome effect as it would enable participants to trade with more confidence in the market price and to better plan their supply and purchase of CERs into the future. Improvements, however, may prove conditional upon the correlation

between the life cycles of sectoral projects, which, if closely related, could lead to greater swings in prices.

5.5.5 Market responsiveness

The sensitivity of CDM markets may also be affected by incorporating sectoral projects into the CDM. A major difference in the functionality of single CDM projects compared with those which operate across an entire sector is the degree to which individuals are exposed to market price signals. As a result of the project baseline and returns being set at an aggregate level, the incentives to abate emissions at the individual level are likely to be distorted. This is largely attributable to a fear that the actions of those that go to great lengths to reduce their emissions will be negated by those who do not; a situation that may result in not meeting the aggregate target and no compensation being paid (Marcu, 2012). For this reason individuals may be reluctant to adjust their emissions to the level that is optimal, at which their marginal cost of abatement is equal to the market price. In such cases, supply would be less sensitive to changes in the market price or demand.

This problem can be addressed through sectoral trading, which removes the need for collective action. Under such a mechanism, installations are faced with individual obligations and rewards, which would help to ensure that projects respond optimally to the needs of the market. Trading could also help to mitigate the risk of oversupply of offsets, by ensuring that the incentives to abate emissions are appropriately adjusted when CDM markets are experiencing a shortage of demand. In this respect, sectoral trading represents a more efficient approach to crediting sectoral projects and one which may dampen the effects and risk of volatile supply.

5.5.6 Policy options for mitigating the market effects of sectoral mechanisms

Whatever impacts a sectoral mechanism imposes on CDM markets, tools exist that may help to dampen those deemed undesirable. On the demand side of the market, options for regulation include the establishment of a carbon bank that could buy and sell allowances to ensure a satisfactory market price, or the introduction of a minimum price for auctioning allowances.

A cap on the use of credits could also be administered that would allow only a fixed percentage of a participant's obligation to be met by the use of offsets. Such an approach has already been introduced in the Kyoto Protocol for temporary certified emission reductions and insured certified emission reductions from forestry-based CDM projects, which can only be used to meet 1% of the compliance obligation of the user country (Schneider & Cames, 2009). The EU ETS also applies similar rules.

Opportunities for regulation also exist on the supply side of the market. One option is a cap on the number of credits that may be issued at the project, national or global level. Alternatively, Columbia has proposed a simple cancellation of a certain proportion of credits, which may vary by country or project type, as a contribution from the project host country towards global mitigation efforts (Schneider & Cames, 2009).

A more advanced method that exists for controlling the supply of CERs is the use of contingent project baselines. Using such a method, baselines would be automatically adjusted relative to movements in the variable upon which they were contingent. The key feature is that the variable would be an indicator of relevant market factors, such as the market price of CERs or the total allowable usage of CERs to meet global obligations. For example, under this approach, if the price of CERs fell below a certain threshold then the baseline for all projects registered while the price was below this threshold would become tougher. This would restrict supply, causing, over time, prices to rise. An advantage of this method, compared with others, is that once the relationship between the contingent variable and the baseline has been agreed upon, supply is automatically adjusted as the market deems appropriate, with no need for political intervention.

Discounting is closely linked to contingent baselines and may also be used as a form of automatic stabilisation. The method works by adjusting the value of a CER on the basis of a relevant external factor. Using per capita emission reductions as an example, when discounting is applied countries with higher per capita emissions, and thus likely lower costs of abatement, would earn less than one CER for each tonne of carbon that they abate, while countries with lower than average emissions might earn a premium (Hepburn, 2009). A more detailed discussion of discounting is provided in section 2.2.1.

5.6 The role of sectoral crediting in scenarios of the future climate policy architecture

What role a sectoral mechanism can play will differ depending on the architecture of future mitigation policies

Sectoral crediting could play several roles in the future climate policy architecture. Depending on what policy space carbon markets end up occupying, the design of and requirement for sectoral approaches will vary. Where a sectoral mechanism is likely to prove most valuable is in the transition from the status quo towards a situation in which comprehensive global emission reduction targets exist. Whether a sectoral mechanism can induce such a shift, as well as providing utility along the path, is a key unknown and is dependent on the politics of the negotiations. In the context of figure 2, sectoral approaches would thus be of most relevance in the inner west part of the diagram, with sectoral crediting approaches being important in the inner north-west quadrant, as that is where a larger scale of offsets would be required to satisfy increasing demand as more countries adopt fixed targets.

In contrast, were a shift to occur towards abandoning targets, there is likely to be little, if any, conceivable role for a sectoral mechanism. There would also be a limited role for a sectoral mechanism if the scope of countries adopting targets remained as it is today, unless it is true that the existence of sectoral mechanisms can induce a shift towards more countries adopting targets.

The following sections outline the role of sectoral crediting under different policy scenarios.

5.6.1 Virtually comprehensive global emission reduction targets (far west of the diagram)

A global emission reduction target implies an international global climate policy architecture in which every country adopts a well-defined and finite GHG emission budget for its entire economy, or as far as is practicable. In this situation, the climate policy would be likely to be located in the south-west of the diagram, where emission allowances can be traded between governments. However, a limited role could still exist for a sectoral mechanism if the climate policy were to head in a crediting direction or, in the context of figure 2, into the north-west policy space.

In a world in which nearly all countries have targets, sectoral mechanisms would play only a niche role. As each country would be responsible for achieving its own target, there would be little incentive to either provide or buy offsets from a crediting scheme. Despite this, areas would still remain where there would be some role for credits, namely where trading or targets were not possible, and it is plausible that sectoral mechanisms would have some function in such places:

- In sectors for which it is not technically possible to implement emissions trading (e.g. the land-use sector);
- In countries where it is technically or politically impossible to implement ETSs (such as poor countries or those in which markets cannot operate effectively);
- Or used as a potential source of international offsets created as a form of indirect linking between ETSs, if direct linking is not possible.

In such cases, where crediting is pursued as an alternative to trading, it is likely that sectoral mechanisms could have some role, with the precise role depending upon the degree of integration or fragmentation of individual schemes. In the case of considerable fragmentation, sectoral mechanisms would have a source of demand in those who wish to capture lower offset prices in schemes other than their own. As schemes become progressively more integrated, the role for sectoral mechanisms would diminish as the price incentive to purchase offsets disappears. In order to maintain the equalisation of prices, it is likely that some offset mechanism would need to have a presence, though it is unlikely that the scale provided by a sectoral mechanism would be necessary to achieve this.

5.6.2 Broader but not comprehensive country-level emission reduction targets (inner west of the diagram)

Under this scenario all developed countries and some emerging economies (perhaps including countries such as China, South Korea and Brazil) would adopt a well-defined emission reduction target for their economy and emission allowances could be traded between governments.

It is likely that in this policy space sectoral mechanisms would have a key role, in the transition to the adoption of comprehensive targets. In the shift between the status quo and a broader adoption of targets, the level of demand for offsets would increase. The existing CDM may not have sufficient capacity to satisfy such a level of demand, thus a role for a larger-scale sectoral offset mechanism would exist. This could be achieved via a new sectoral mechanism or by expanding the CDM to incorporate sectoral projects.

Sectoral mechanisms could also play a role in facilitating the transition to the adoption of comprehensive targets by means other than supplying offsets. Sectoral mechanisms would be able to develop reporting and verification capacities in countries where these do not already exist, helping to a build the necessary infrastructure for adopting targets and implementing an ETS. This would potentially provide a justification for sectoral mechanisms that would hold even in the absence of the need for increased offset supply.

The current project-based CDM also has the potential to play this role of a transitional mechanism, and the experience in some countries, such as China, has been that the CDM has been an effective preparation for a transition to domestic emissions trading. Whether a sectoral approach would be preferable to this depends upon the additional assistance deemed to be given by sectoral rather than project-based schemes (a matter of both technicalities and politics) and of the costs in terms of time and resources of developing a new mechanism rather than continuing with the current one. The shorter the likely transition to the adoption of more comprehensive targets, the lower the value in developing a new mechanism.

5.6.3 Current architecture – the status quo (centre of the diagram)

This scenario would see most developed countries adopting well-defined emission reduction targets for some areas of their economy and emission allowances being traded between governments.

The role of sectoral mechanisms in this policy space is uncertain. Of fundamental importance is that, as shown above, demand for offsets in the status quo may not, in its current form, justify the scale of offsets that a sectoral mechanism would supply. Thus, sectoral mechanisms would be conditional upon the balance of offset demand and supply in global carbon markets, a factor that could be affected by:

- The architecture of the sectoral mechanism itself, with regard to the manner in which baselines and participation restrictions are set, and thus the scale of the offsets it may generate;
- The ambitiousness of the targets set by developed countries;
- The contribution of project host countries to global mitigation (for instance through tougher baselines or cancelling of offsets).

There may also be some role for sectoral mechanisms to facilitate a transition towards the greater adoption of targets, regardless of the presence of sufficient demand. If it were deemed desirable to have a policy architecture in which all countries have well-defined targets, then sectoral mechanisms may be justified on the grounds that they would develop the necessary infrastructure for doing so.

5.6.4 Reduction in the scope of binding emission reduction targets or a shift towards no targets whatsoever (inner east/far east of the diagram)

Under this scenario only a few developed countries (e.g. European countries) would adopt well-defined and limited emission reduction targets or the global climate policy architecture would collapse altogether. Under such scenarios there is a limited role for all offset mechanisms, as there would be few, if any, binding targets to use offsets to meet. While some transfer for offsets may occur, this would be likely to be done only in the capacity of development assistance or to promote objectives other than achieving emission reduction targets. There would thus be no role in such a policy space for a sectoral mechanism.

5.7 Conclusions on sectoral mechanisms

The role that sectoral mechanisms will play in the future climate policy architecture remains, at this stage, unknown. Depending on how the characteristics of global climate change mitigation develop, sectoral approaches could take on a range of positions, from being unnecessary, through facilitating the transition to the adoption of universal emission reduction targets, to being a tool for the indirect linking of ETSs.

Since the decision of the COP to define an NMM, the merits of sectoral approaches have been greatly scrutinised. Some Parties to the Convention have expressed strong support for a new mechanism that is sectoral, noting the potential to address leakage and to provide a means for host countries to develop the requisite infrastructure for adopting targets. Indeed, paragraph 80 of decision 1/CP.16, referenced in paragraph 83 of decision -/CP.17, explicitly refers to the fact that the new market-based mechanism is to take into account "stimulating mitigation across broad segments of the economy". Other Parties, however, are strongly opposed to sectoral approaches as a result of, among other things, the current state of CDM markets, the scale of mitigation potential that they may harbour and their inability to incentivise private action.

Were sectoral approaches to be pursued, they would, in all likelihood, have noticeable effects on the CDM market. One of the key concerns that has been raised is that in the short run insufficient demand exists to absorb the supply of offsets that a sectoral mechanism may deliver. The implications of excess supply would place further downward pressure on CER prices, which would crowd out projects with higher marginal abatement costs and thus many projects with desirable returns in terms of sustainable development. However, there are options on both the demand and supply side of the market for maintaining a desirable CER price, although administration of these would erode the mechanism's cost-effectiveness. There are a number of reforms that would need to be undertaken in order for the CDM to either operate alongside or evolve into a sectoral mechanism, and, while these will take some effort to introduce, there are no insurmountable technical or economic barriers.

There is little justification for sectoral mechanisms if it is not expected that global mitigation efforts will increase in future: the existing CDM has shown that it has the required capacity to address the demand for offsets both now and in the short to medium term. In the light of this, were sectoral projects to be introduced at present, this would need to be done on grounds other than scale, such as to facilitate the transition towards more widespread targets or in preparation for future demand.

If the global climate policy architecture were expected to shift towards the adoption of universal targets, then an expansion of the existing CDM to incorporate sectoral projects may be desirable, perhaps alongside baselines which differentiate between project host countries on the basis of per capita income or per capita emissions, in order to provide a gradual transition to a broader range of commitments that are still consistent with the principles expressed by the international community. A development into this policy space would be likely to require an expansion of the supply of offsets, beyond what is possible through existing mechanisms in their current state. With this in mind, despite the current lack of demand, a gradual introduction of sectoral projects into the CDM may be advisable as a way to address the inevitable teething problems that sectoral approaches will encounter. For countries for which the adoption of targets remains a more distant prospect, such an introduction may also provide a means for them to develop their emission reporting capabilities by hosting sectoral projects, an essential step towards such countries adopting emission targets of their own.

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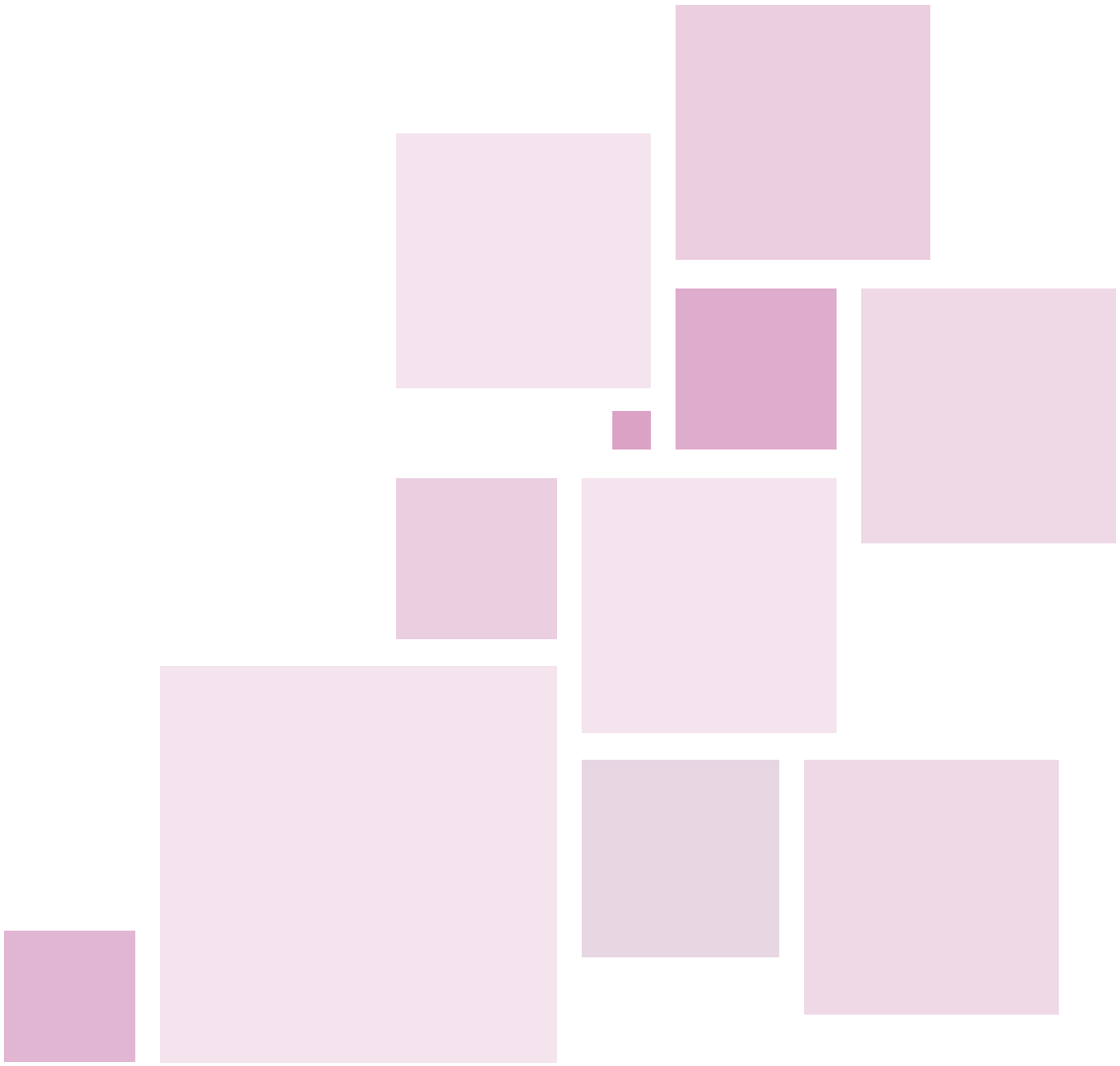

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