FLEXIBLE MECHANISMS IN SUPPORT OF A NEW CLIMATE CHANGE REGIME

THE CLEAN DEVELOPMENT MECHANISM AND BEYOND

CEPS TASK FORCE REPORT

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This report is based on discussions in the CEPS Task Force on The CDM and Future Flexible Mechanisms post-2012. The Task Force met several times over a concentrated period of time from November 2008 to May 2009. Participants included senior executives from a broad range of industry and representatives from business associations and non-governmental environmental organisations. A list of members and invited guests and speakers appears in Annex 2.

The members of the Task Force engaged in extensive debates in the course of several meetings and submitted comments on earlier drafts of this report. Its contents contain the general tone and direction of the discussion, but its recommendations do not necessarily reflect a full common position agreed among all members of the Task Force, nor do they necessarily represent the views of the institutions to which the members belong.

Christian Egenhofer and Anton Georgiev from CEPS made valuable contributions to the preparation of this report.

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PREFACE

It has been my privilege over the past year to chair the CEPS Task Force on future mechanisms with a view to providing policy recommendations to those involved in shaping a future climate change regime and to stakeholders. In doing so, I owe particular appreciation to the members of the Task Force, drawn from a wide range of businesses, industries, research centres and environmental NGOs, who gave their expertise and time, presenting the viewpoints of different interests. The Task Force also benefited from the contributions and advice from European Commission and member state officials who generously shared their expertise and reflections, helping us to remain focused on what soon became a rapidly emerging agenda. Last, but not least, we were fortunate to be able to always count on CEPS support throughout the Task Force.

This CEPS Task Force Report has been able to consider both the current operation and the continuation of the Kyoto mechanisms and well as the possibilities through the Bali Action Plan for introducing new mechanisms and tradable units after 2012, i.e. the first commitment period of the Kyoto Protocol. In order to help both ourselves and our readers better understand these issues, we have developed a set of criteria against which to compare the potential mechanism options.

From our discussions, we have little doubt that flexible mechanisms will play crucial roles in not only facilitating a post-2012 agreement between Parties but also inspiring a wide range of actions to implement the agreement. Like the current climate change regime, subsequent periods will witness the co-existence of multiple mechanisms that can be run in parallel or in combination. These can, in time, lead to the development of a global carbon market. Existing and new flexible mechanisms are also expected to provide a focus for the major levels of business investment required to support any post-2012 agreement.

Discussions were always rich, the debate was at times intense and I am sure that this Task Force has improved the understanding of the existing and new flexible mechanisms in the run up to Copenhagen in December 2009 and to a new international climate change agreement. I hope that whilst answering some of the outstanding questions, this report will further stimulate thinking on and the development of post-2012 mechanisms that can contribute to significant environmental as well as economic benefits.

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EXECUTIVE SUMMARY

In the UN negotiations on climate change, participating governments have explored the possibility to introduce new flexible mechanisms in support of a future international climate change regime. These include, among others, sectoral crediting, sectoral trading, Nationally Appropriate Mitigation Actions (NAMAs) and Reduction of Emissions from Deforestation and forest Degradation (REDD). Meanwhile, there has been continuous discussion on reform of the Clean Development Mechanism (CDM) and Joint Implementation (JI) – and their several variations. This report considers and compares the relative merits of a selection of these proposed mechanisms on the basis of their compliance with a set of selected objectives. Its findings and recommendations are aimed at international negotiators as well as at EU stakeholders (including business) with a view to contributing to the discussions on existing and new flexible mechanisms.

The basic assumption is that flexible mechanisms will play a crucial role not only in facilitating a positive outcome in the UN climate negotiations, but will also inspire a wide range of actions on their own. Moreover, they are expected to provide a focus on business investment. Like the current climate change regime, subsequent periods will witness the co-existence of multiple mechanisms that can run concurrently or in combination with one another.

This report first outlines the various motives attributed to the different stakeholders behind the flexible mechanisms and takes stock of the experience acquired with the existing mechanisms under the Kyoto Protocol. We then explore four mechanisms (reformed CDM, reformed JI, sectoral crediting and sectoral trading) and compare these options against three sets of objectives: environmental integrity, enhanced investment and institutional strength at the international level (e.g. integrity of mechanisms

with the overall architecture, compatibility between mechanisms and coherence of the framework).

This report is written in non-technical language with the aim of addressing a wide range of stakeholders. It focuses on key issues such as 'motivations', 'mechanism options', 'lessons' and 'objectives', while fully recognising the importance of other issues not covered here.

I. Key messages

1. There are different motivations behind flexible mechanisms.

Although recognising that there are additional driving forces behind the proposed mechanisms, the Task Force members concluded that the options under consideration have been principally shaped by four major motivations: reducing greenhouse gas (GHG) emissions, developing a carbon market, diffusing technology and substantially increasing the magnitude of financing. This array of motivations implies that it may not be sufficient to simply reform existing mechanisms but that they will need to be supplemented with new ones. The availability of new flexible mechanisms will most likely encourage countries to take on more stringent levels of commitments than they could by their own efforts alone, thereby facilitating the conclusion of a global comprehensive agreement. Moreover, flexible mechanisms can be regarded as a catalyst to re-direct financial and investment flows to a range of mitigation opportunities across sectors and activities. While there is a call, particularly from the EU and some stakeholders, to move from pure offsetting to crediting in order to scale up global emissions reductions, ultimately achieving the climate objective will depend on the level of international commitments undertaken as well as on the nature or design of any flexible mechanism finally devised.

For developing countries, it is important that existing and new mechanisms allow growth and development to continue in a robust and environmentally-sound manner, through incremental investment from Annex I countries and businesses. They should also lead to credits that are redeemable in the external market.

2. Supply and demand need to be balanced.

The impact of flexible mechanisms on GHG emissions reductions depends on the balance between the supply of and demand for credits and the resulting price level in the carbon market. An increase in the supply needs

to be balanced by an increase in demand; otherwise, the carbon price and incentives to reduce emissions would be eroded.

The Kyoto Protocol and its reduction commitments were agreed in 1997, several years before the development of the structure and subsequent operation of the carbon market. It is now clearly recognised that transition economies will accrue a significant surplus of AAUs resulting from the base year specified in the Kyoto Protocol. The magnitude of the resulting surplus of AAUs, compared to actual emissions levels, has been estimated at up to 10 billion tonnes. If some or this entire surplus were to be introduced into the carbon market, it could have a major impact on the market, including the reformed and new UN market mechanisms, which are the subject of this report. This topic was not discussed in detail in the Task Force but the potential negative effect of surplus AAUs on the carbon market has been identified in discussions within the European Union.

3. There are many lessons to be learned from existing mechanisms.

To date, most of the lessons from existing mechanisms have been learned by taking stock of the Clean Development Mechanism (CDM).

Clean Development Mechanism (CDM). The CDM has achieved a number of important benefits: GHG emissions reductions and sustainable development in non-Annex countries; first steps towards MRV (measurement, reporting and verification) and GHG accounting; participation of the private sector; investment flows to developing countries; raising awareness of abatement opportunities; and revenue generation. Areas for further discussion include the uneven distribution of projects, preferential treatment for Least Developed Countries (LDCs), additionality, administrative and organisational issues, offsetting and technology transfer. Two areas subject to ongoing improvement are: Programmes of Activities (PoAs) and sectoral benchmarking in the CDM.

Joint Implementation (JI). JI started more recently and operates on a smaller scale. Simplification of procedures and relative flexibility in scope and process contributed to a considerable increase in the number of JI projects under the Track I. Some areas for discussion and ongoing improvements are similar to those under the CDM: simplification of baseline setting and extension of the scope.

Assigned Amount Unit (AAU) trading/Green Investment Scheme (GIS). The design of AAU trading system has been left to participating Annex I countries. One form of AAU trading is the GIS, a scheme that attempts to

finance environmental measures with revenues from the sale of surplus AAUs. The GIS has less history and operates on a smaller scale. Among the most critical issues are double-counting of units, a host country's capacity to run the scheme, enforcement of its pledge to implement environmental measures and transparency in AAU transactions.

4. Options for future mechanisms exist.

Like existing mechanisms, flexible mechanisms in future would aim to contribute to advancing climate objectives, i.e. achieving real global emissions reductions and possibly other specific objectives such as sustainable development, technology transfer and financing.

CDM. Programmes of Activities (PoAs) are a programmatic version of the CDM, registering a set of activities of the same type under a single umbrella. Sectoral benchmarking in the CDM credits emissions reductions below the baseline based on a pre-determined benchmark for a sector or a sub-sector. Expansion of the scope to sectoral and programmatic activities could help to strengthen the CDM and address more mitigation opportunities. On the other hand, an increase in the number of CDM projects would require improvements in efficiency of administration and an increase in the transparency of governance.

JI. To become an optimally functioning mechanism, JI must deal with administrative and organisational issues pertaining to the Joint Implementation Supervisory Committee (JISC) as well as more technical issues such as baseline setting and methodology choices.

Sectoral crediting. A sectoral crediting mechanism credits emissions reductions from a covered sector against a threshold well below the 'business as usual' scenario. If the mechanism is based on a 'no-lose' target, the threshold can be regarded as an artificial target without binding consequences. Sectoral crediting could set a price signal for a broader part of the economy, including power and key industry sectors. A technical merit is its circumvention of the additionality test problems on a project basis. There are several challenges: preventing double-counting, setting the boundaries of the sector, establishing the baseline that is substantiated by data collection and incorporates the specific circumstances of a country, sector, or technology; and upgrading technical and institutional capacity. For baseline setting, it is worth mentioning that in some non-Annex I countries many of the industries to be covered are either owned or operated by governments. Several questions remain open to debate: i) Should credits be issued directly to companies in sectors or channelled

through the government? ii) Can sectoral crediting based on no-lose targets co-exist with the current CDM or other flexible mechanisms? iii) Will the mechanism be structured to encourage upfront private sector investment?

Sectoral trading. Sectoral trading is a cap-and-trade scheme applied to a whole sector or a sub-sector within a country. The scheme is aimed at countries that are not yet ready to take on binding national targets but are prepared to take on binding targets in key sectors such as power and industry. If the government has taken on a binding target for the sector, the sectoral cap-and-trade scheme would be mandatory in principle. In addition to environmental integrity and involvement of the private sector, the benefit of sectoral trading is the possible creation of a level playing field, which is a decisive factor for energy-intensive industry that is competing globally irrespective of Annex I/non-Annex I country borders. Some challenges are similar to those of sectoral crediting: boundary setting and consideration given to specific circumstances of a country, a sector or a technology in baseline setting.

5. *Mechanisms can be compared according to at least three objectives environmental integrity, enhanced public and private investment and institutional strength at an international level.*

The Task Force has formulated three sets of objectives that any reformed or new mechanism should meet: environmental integrity, enhanced investment and institutional strength at an international level. These three objectives are considered to be common to the four mechanism options – reformed CDM, reformed JI, sectoral crediting and sectoral trading – although their relevance may vary from one option to another. While there are other equally important objectives, such as contributing to sustainable development, competitiveness and a level-playing field, the latter of which is immensely important for energy-intensive industry, they would not necessarily apply to all mechanisms or sectors.

Environmental integrity. Ultimately all mechanisms need to guarantee that they deliver 'real' emissions reductions. One of the ongoing controversies relates to the current CDM as being largely offsetting. A good starting point would be a mechanism or design option that rewards ambitious and dynamic baseline levels, including some measure of international average or best practice in environment. Such options are offered by the reformed CDM and sectoral crediting. JI and sectoral trading are less problematic because in theory they incorporate direct and explicit

links to AAUs. However, this depends on the level of initial allocation of these units in light of environmental integrity.

Enhanced Public and Private Investment. Leveraging private investment depends on i) improving the investment conditions, in particular, improving the predictability of the processes and their time scales of operation and ii) making clear that there will be a rate of return for private sector capital. Sectoral crediting and sectoral trading depend on the host country's ability to implement intermediary, national systems. In general cap-and-trade types of emissions trading (e.g. sectoral trading) could leverage a greater scale of financial flows or private investments than other baseline-and-credit type options (reformed CDM, reformed JI, sectoral crediting).

Institutional strength. An effective mechanism must work well on its own, work together with other mechanisms and fit in with any future architecture devised. Timing is also a critical element in the evolution of existing mechanisms and the introduction of new ones, especially the end-dates for access to the mechanisms. There could be several paths built upon existing and new mechanisms. One possible path for consideration would be the transformation of sectoral crediting into sectoral trading through tightening the baselines, ultimately into economy-wide cap-and-trade. Another option would be to explore the possibility of converting the CDM into JI, inviting new Annex I countries and sectors. Clarification of these paths could offer investors more predictability on which to base their investment decisions.

II. Recommendations

Existing and new mechanisms

1. CDM and JI should enhance efficiency, transparency and governance.

CDM

- Confidence must be maintained in the CDM in order to encourage continued and future investment and increased participation from both Annex I and developing countries.
- Reform of the CDM governance should include a review of the procedural efficiency of CDM-related regulatory bodies, including the Executive Board, assurances for clear definition of roles and responsibilities of all bodies, the Board's transition to a permanent full-time body and the establishment of an appeal procedure for third parties.

- The governance reform should also attempt to simplify or improve the additionality assessment to reduce subjectivity and unpredictability.
- Parties should provide the CDM with a governance structure, management systems and guiding principles including due process, efficiency, predictability, consistency and transparency.
- Parties should streamline the registration and issuance process and simplify the procedures in order to increase efficiency.
- Parties should facilitate improvement in access to under-represented countries, sectors and technology types.

JI

- Host countries could introduce their own simplified procedures.
- Host countries should clarify Track I procedures that are currently either vague or unavailable.
- As reductions from JI projects are backed by the AAUs, the Track II requirements for additionality and baseline setting could in principle be simplified.
- Determination of Track II additionality and baseline criteria could be under the competence of the host country.

The environmental integrity of JI can be safeguarded in doing such simplifications, provided that the target setting for the country has been stringent in the first place.

2. Offset crediting in the CDM should be limited.

- Ultimately, the environmental integrity of a flexible mechanism is a function of the stringency of a country's commitment or an installation's cap, in addition to the nature of the mechanism itself. Therefore, any incentive embedded in the mechanism that would weaken the commitment or cap should be reduced or eliminated. In the CDM reform, offset crediting could, in time, be limited to credits from less advanced developing countries.

3. Sectoral benchmarking in the CDM and sector targets for JI should be considered as future options.

- Overlap between sectoral benchmarking in the CDM and sectoral crediting based on no-lose credits should be avoided. Clear

definitions must be formulated for the two options in order to give unambiguous signals to investors.

- Countries hosting JI projects should be able to take on binding sector targets, thereby further stimulating the reduction of emissions from their key sectors and complementing the national cap.

4. In the future, JI should continue to allow host countries to choose whether to follow Track I or Track II and should integrate new Annex I countries and new sectors.

- In the future, JI should continue to give host countries the choice to rely on the JISC for the approval of projects (Track II) and accreditation of Independent Entities or to approve projects and implement national determination, verification and accreditation measures (Track I), provided the JI host country meets the full set of eligibility criteria under the Marrakesh Accords.
- JI should be made more attractive to countries or sectors that are potentially interested in joining the Annex I grouping and all efforts should be made to integrate these countries. An attractive JI could be used as a bargaining tool for countries to join Annex I.

5. The CDM could be transferred to JI.

- JI should be expanded so as to encompass the transformation of CDM project activities to a capped environment (backed by AAUs).
- Parties should consider how to link the verified future emissions reductions with AAUs once the CDM project activities are transferred to JI.
- Parties should explore how to manage the transition of CDM projects that will have been registered and already entered into their crediting period when the sector is capped.

An institutional framework and transition

6. An institutional framework for existing and new mechanisms should provide clarity about investors' access to market mechanisms and improve predictability about investment conditions.

- Confidence must be established in the market-based approach, in particular through demonstrating that there is long-term

predictability associated with the flexible mechanisms and the carbon market.

- There should be an orderly transition between different types of flexible mechanisms. Governments should consult with market participants in designing how existing and new mechanisms can run alongside or in succession.
- Reform of existing mechanisms should be practical with a view to making rules and procedures work better.
- Reformed mechanisms should be ready as soon as possible to allow a predictable transition through to the implementation of new mechanisms.
- While reformed mechanisms are up and running, support for capacity-building aimed at new mechanisms must be provided as it takes a long time for new mechanisms to become operational (e.g. setting benchmarks, agreeing on where to set the benchmarks and on how much flexibility is to be allowed in the benchmarks) and for institutions to be established.
- New mechanisms should be simple, functional and cost-effective for a participating company (e.g. the company's cost of participation should not outweigh expected benefits) and offer potential benefits to investors.

7. A long-term domestic regulatory framework ideally backed by an international agreement should be able to provide some clarity about stakeholders' access to market mechanisms and improve predictability about their investment conditions.

- Parties should provide rules on treatment of double counting especially during a transition period while more than one mechanism will likely operate simultaneously.
- Parties should make explicit the circumstances and timeframe under which a particular mechanism can be used.
- Parties should consider applying sunset clauses for changes to the different mechanisms.

8. Parties should consider at least two paths for evolving flexible mechanisms, sectoral approaches and the transfer of the CDM to JI.

- In cooperation with stakeholders, Parties should accelerate and advance their discussions on sectoral crediting and sectoral trading with a view to reaching an understanding about the objectives and structure of each mechanism in Copenhagen. They should then move on to the next stages of designing and operationalising each mechanism.
- Parties should explore paths for the evolution of CDM projects into the JI process for countries that have moved into Annex I in a new agreement after Copenhagen, in parallel with possible sectoral approaches.

INTRODUCTION

The Kyoto Protocol has established three market-based mechanisms, all of which contribute to the development of carbon markets: international emissions trading (Assigned Amount Unit (AAU) trading), the Clean Development Mechanism (CDM) and Joint Implementation (JI). These mechanisms, which are also called 'flexible mechanisms', are intended to supplement efforts by the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) to reduce their own greenhouse gas (GHG) emissions in order to help them meet their respective commitments. Flexible mechanisms were designed, among other reasons, to help the so-called 'Annex I Parties'[1] meet emissions limitation or reduction commitments in the most cost-effective manner.

While a majority of Parties acknowledge the merits of these multiple mechanisms, their future remains open to discussion. In UN negotiations, Parties have explored the possibility of introducing new flexible mechanisms in support of a future international climate change regime. These include sectoral crediting, sectoral trading, Nationally Appropriate Mitigation Actions (NAMAs) by developing countries and Reduction of Emissions from Deforestation and forest Degradation (REDD). Meanwhile, there has been continuous discussion on the CDM or JI reform and their several variations. This report compares the relative merits of a selection of these proposed mechanisms on the basis of their compliance with a set of selected objectives. Its findings and recommendations are directed at international negotiators as well as EU stakeholders including business

[1] Annex I Parties to the UNFCCC consist of developed countries and countries designated as Economies-in-Transition.

with a view to contributing to the discussion on existing and new flexible mechanisms.

The basic assumption is that flexible mechanisms will likely play a crucial role not only in facilitating a positive outcome in the UN climate negotiations, but will also inspire a wide range of actions on their own. Moreover, they are expected to focus attention on the necessary business investment required to support any future agreement. Like the current climate change regime, subsequent periods will witness the co-existence of multiple mechanisms that can run concurrently or in combination as the Kyoto Protocol's three flexible mechanisms and domestic market-based mechanisms including the EU-ETS already do today. While learning from experience in existing mechanisms and improving them will be one step, creation of new mechanisms will be another. Like the existing ones, the new flexible mechanisms would aim to contribute to advancing climate objectives, i.e. achieving real global emission reductions and possibly other specific objectives such as sustainable development, technology transfer and financing.

It is likely that different types of mechanisms will enable each country to meet specific needs and accommodate national circumstances (e.g. data availability and levels of economic development). Different mechanisms therefore could target different needs and circumstances. Each mechanism would have its own goal, constituency, beneficiary and time-frame. Such co-existence of multiple mechanisms suits a growing diversity in groups of participating countries as 'one size does not fit all'. However, there is concern that the development of too many mechanisms may actually 'confuse' or reduce private sector investment though over-broadening the focus. A similar logic could apply to sectors. Probably no single mechanism is able to capture all the mitigation opportunities across key emitting sectors. Different sectors need different mechanism options. Flexible mechanisms could provide Parties with incentives to join in a future agreement and provide finance much needed for combating climate change. Yet, there is a need for incentives not only to join in but also to move on towards the climate objectives. There can be several paths built upon existing and new mechanisms, be they fast tracks or not, for moving forward. There are also ways to differentiate a Party's access (e.g. preferential treatment, eligibility criteria) to a mechanism.

This report is structured as follows. Chapter 1 outlines the various motives attributed to the different stakeholders behind the flexible mechanisms. Chapter 2 draws lessons learnt from existing mechanisms

under the Kyoto Protocol such as the CDM, JI and AAU trading. Chapter 3 explores four future mechanisms: reformed CDM, reformed JI, sectoral crediting and sectoral trading. Chapter 4 assesses and compares these mechanisms against three sets of objectives: environmental integrity, enhanced investment and institutional strength at the international level (e.g. integrity of mechanisms with the overall architecture, compatibility between mechanisms and coherence of the framework). Chapter 5 closes the discussion with concluding remarks.

This report is written in non-technical language to address a wide range of stakeholders. It focuses on key issues such as 'motivations', 'mechanism options', 'lessons' and 'objectives', while fully recognising the importance of other issues not covered here.

1. MOTIVATIONS BEHIND THE FLEXIBLE MECHANISMS

Although recognising that there are additional driving forces behind the proposed mechanisms, this report suggests that the options under consideration have been principally shaped by four major motivations: achievement of GHG emissions reduction commitments; the development of a carbon market, accelerating technology diffusion and scaling-up of financing. This wide array of different motivations implies that it may not be sufficient to simply reform the existing mechanisms; in addition we need to consider how new mechanisms could satisfy at least part of these motives and supplement the existing ones.

Driven by these motives, flexible mechanisms will likely play a number of important roles in a future international framework:

- To enable *developed countries* to achieve their emissions reduction commitments at lower costs,
- To induce carbon markets to decrease compliance costs,
- To provide carbon finance for low-carbon investment in *developing countries*,
- To ensure *developing countries*' own mitigation contributions and
- To facilitate technology transfer to *developing countries.*

The following sections describe the motives behind flexible mechanisms and the expected roles that they could play.

1.1 Setting GHG emissions reduction commitments

Future flexible mechanisms are expected to contribute to real emissions reductions on a global scale by supplementing a developed country's or an installation's own emissions reductions for compliance with its

commitment. This means that developed countries' commitments go hand in hand with flexible mechanisms and therefore they should be negotiated in a package.

While there is a call, particularly from the EU and some stakeholders, to move from pure offsetting to crediting in order to scale up global emissions reductions, ultimately achieving the climate objective will depend on the level of international commitments undertaken as well as on the nature or designs of any flexible mechanism finally devised.

According to the European Commission (2009a and b), global GHG emissions need to peak globally by 2020 and decrease by up to 50% from 1990 levels by 2050 in order to achieve a 50% chance of limiting the global average temperature rise to 2C° (450 ppm). If the probability is to be raised above 50%, global emissions need to be reduced by more than 50% from 1990 levels by 2050. Stabilising emissions at 450 ppm would require Annex I countries as a group to reduce GHG emissions by 25% to 40% by 2020, and 80% to 95% by 2050, even if emissions in developing countries deviate substantially from baseline projections in key regions, according to the IPCC Fourth Assessment Report (Gupta et al. 2007: 776; see also European Commission 2009b). More recently it is reported that for the first time in history the share of global CO_2 emissions from developing countries (50.3%) has slightly exceeded that of industrialised countries (46.6%) (Netherlands Environmental Assessment Agency (PBL), 2009). In other words, without their contribution, any early stabilisation would be impossible to achieve.

Parties to the Kyoto Protocol are negotiating further commitments of GHG emissions reductions by Annex I countries for the next commitment period starting in 2013. Parties to the UNFCCC aim at reaching a comprehensive global agreement in parallel with the Kyoto Protocol. The availability of new flexible mechanisms will most likely encourage countries to take on more stringent levels of commitments than they could commit to by their own efforts alone, thereby facilitating the conclusion of a global agreement.

1.2 Developing a carbon market

Flexible mechanisms must appeal to market operators and provide incentives for participation. To encourage the private sector to take part in the market mechanisms, procedures must be clear, predictable and not subject to rapid change.

Carbon markets should function well. If they do not, part of the failure could eventually be attributed to inappropriate boundary conditions, e.g. lack of ambitious international targets or fragmented markets. The uneven and uncoordinated carbon constraints currently imposed on major industry sectors across countries have raised concerns over international competitiveness and carbon leakage. The development of a global carbon market that functions well and is supported by a global comprehensive agreement would solve a number of problems arising from boundary conditions, as described above.

The global carbon market has grown steadily since 2004, largely driven by the EU-ETS. In 2008 the carbon market (e.g. the EU-ETS, CDM, JI and others) was valued at an estimated €92 billion ($125 billion) in 2008, which was more than double the 2007 figure of €40 billion (Point Carbon, 2009). Another estimate placed its value at €86 billion ($126 billion) at the end of 2008, also doubling the 2007 value (Capoor & Ambrosi, 2009).

In circumstances where the product is 'artificial' (as in the case of a 'reduction' in greenhouse gas emissions), flexible mechanisms should be carefully analysed to ensure appropriate supply and demand. The impact of a flexible mechanism on GHG emission reductions depends on the balance between the supply of and demand for credits and the resulting price level in the carbon market. In carbon markets, demand is determined by the level of ambition for emissions reductions in internationally negotiated commitments or domestic caps. Supply is set by the volume of credits or allowances created by flexible mechanisms.

Demand for credits from the Kyoto flexible mechanisms over the 2008-12 period is estimated at 1,635 $MtCO_2e$, of which the private sector accounts for 65% – mostly through the CDM and JI (Table 1).

Capoor & Ambrosi (2009) note that their estimate of CERs (certified emissions reductions) supply is much lower (in the range of 1.1-1.3 billion) than other analysts' expectations (ranging from 1.33 to 1.72 billion CERs). At the higher end, Trotignon & Leguet (2009) estimate a generation of 1.6 billion CERs before the end of April 2013. At the lower end, UN RISØ Centre predicts that the amount of CERs to be available by the end of 2012 will total 1,168 million.[2] It is possible that the expected amount of supply will not materialise. There are a number of factors leading to a downward

[2] According to data reported on http://cdmpipeline.org, as of 1 November 2009.

revision, for example, a lower entry of new projects into pipelines, a lower monthly issuance or bottlenecks along the project cycle. It is important to take lead-time into account as projects in the pipeline take time to implement and they do not always deliver the quantity of credits that were predicted.

Table 1. Supply and demand in perspective, Kyoto Market Balance (2008-12)

Potential demand from industrialised countries ($MtCO_2e$)		**Potential supplies** ($MtCO_2e$)		
Country or entity	KMs demand		Likely	Max
EU	**1,200**	**Potential GIS**	**990**	**1,910**
Govt EU-15	450	Russian Fed.	?	?
Priv sec EU ETS	750	Ukraine	500	1,000
Possible addt'l demand	125	EU-8+2	490	910
Japan	**400**			
Govt Japan	100			
Priv sec Japan	300			
Possible addt'l demand	125			
Rest of Annex B	**35**	**CDM+JI**	**1,671**	**1,430-1,974**
Government	20	CDM	1,489	1,330-1,724
Private sector	15	JI	172	100-250
Total	**1,635**			
Government	570			
Private sector	1,065			
Possible addt'l demand	250			

Source: Capoor & Ambrosi (2009).

As a new climate change regime envisages deeper and wider commitments for emissions reductions in Annex I countries, a balanced supply and demand in carbon markets requires future large-scale supply of credits from existing or new flexible mechanisms, especially those targeting

large-scale projects or technologies. In other words, an increase in the supply needs to be balanced by an increase in demand; otherwise, the carbon price and incentives to reduce emissions would be eroded. A balanced supply and demand in the carbon market together with Annex I countries' deeper commitments will send a robust and strong carbon price signal to investors. Conversely, a major imbalance in supply will lead to a price collapse.

The Kyoto Protocol and its reduction commitments were agreed in 1997, several years before the development of the structure and subsequent operation of the carbon market., It is now clearly recognised that transition economies will accrue a significant surplus of AAUs resulting from the base year specified in the Kyoto Protocol. The magnitude of the resulting surplus of AAUs, compared to actual emissions levels, has been estimated at up to 10 billion tonnes. Should some or all of this surplus be introduced into the carbon market, it could have a major impact on this market, including the reformed and new UN market mechanisms, which are the subject of this report. This topic was not discussed in detail in the Task Force but the potential negative effect of surplus AAUs on the carbon market has been identified in discussions within the European Union.

For credits supply up to 2020, the UNFCCC (2008) quotes the ECN study concluding that the total mitigation potential in developing countries is likely to exceed 7 $GtCO_2eq$ per year in 2020, including REDD and CCS (Bakker et al., 2007). At the higher end the Carbon Trust (2009) concludes that over the 2013-20 period the total supply would range from 15,000 to 20,000 $MtCO_2eq$, which is more than 20% of total projected emissions from the EU and Japan over the period. However, this estimate could be lowered due to the above-mentioned risks concerning shortages in credits or delays in registration and credit issuance.

On the demand side, at the time of writing, not all Annex I countries have set firm binding commitments for GHG emissions reductions up to 2020. Information is limited concerning where and how much potential demand will be found over the 2013-20 period. The UNFCCC (2008) quotes various estimates ranging from 500 to 1,700 $MtCO_2eq$ in 2020.

The EU-driven demand up to 2020 (see Table 2) is estimated in the range of 3,300 to 4,740$MtCO_2eq$ depending on the scenarios.

Table 2. Total EU credit demand up to 2020

	20% scenario ($MtCO_2eq$)	**30% scenario ($MtCO_2eq$) Only indicative**
EU ETS 2008-20	1,700-1,900	2,570
EU government 2008-12 (CERs, ERUS or AAUs)	870	870
EU government 2013-20	750	1,300
Total	~3,300 – 3,500	4,740

Source: Point Carbon as shown by S. Schjolset in a presentation to the Task Force, 14 January 2009 (see http://www.ceps.eu/taskforce/cdm-and-post-2012-flexible-mechanisms).

Baron et al. (2009) assume that only half of the amount of credits worth about 2.8 to 3.1 $GtCO_2eq$ that the EU allows access to over the 2008-20 period would be available over the 2013-20 period under the 20% reduction scenario, and estimates that the annual average demand of the EU would be about 185 $MtCO_2eq$. The US could become potentially one of the largest buyers in the carbon market, but its projected demand level is less clear. New Carbon Finance estimates that the US would import credits worth about 800 $MtCO_2eq$ annually over the 2012-20 period. Consequently the sum of the EU and US annual demand would amount to about 1$GtCO_2$ eq (as estimated by New Carbon Finance in Baron et al., 2009).

1.3 Accelerating technology diffusion

The IEA argues that improved efficiency and decarbonising electricity could bring CO_2 emissions back to current (2005) levels by 2050. The portfolio of technologies intended to reduce emissions from 62$GtCO_2$ in the reference scenario to 14$GtCO_2$ in the alternative policy scenario include end use efficiency, renewables, CCS power generation and nuclear.[3]

These forecasts show the challenges to reduce greenhouse gas emissions and facilitate a shift to a low-carbon economy with the aid of clean technology. Ambitious GHG reduction commitments in both the long

3 P. Boot, presentation at CEPS Task Force meeting, 19 February 2009 (see http://www.ceps.eu/taskforce/cdm-and-post-2012-flexible-mechanisms).

and short term are required as soon as possible in order to provide the predictability needed for investment decisions in clean (low-carbon) technologies. There is a sense of urgency to roll out low-carbon technologies and to minimise the 'lock-in' of today's technologies, requiring investments to start as soon as possible; in other words, large infrastructure and capital-intensive investments need to be made right now in advanced developing countries. This sense of urgency stems from a recognition of mid- to long-term global emissions trajectories and the necessary lead-time for investments in large infrastructural development, especially those to take place in the energy sector in advanced developing countries in the coming decades. The risk of a gap between pre-2012 and post-2012 periods has created high uncertainty causing delays in investment decisions.

A robust and strong carbon price signal sent by flexible mechanisms to investors would set up the right incentives for investment in low-carbon technologies.[4] Flexible mechanisms could have a role in triggering an adequate future supply of credits linked to specific technology types. See, for example, the proposals being put forth for carbon capture and storage (CCS) technologies listed in Box 1.

These proposals show the potential for flexible mechanisms to support deployment of specific technology types.

[4] Such a signal is unlikely to be sufficient to stimulate the large-scale requirements for funding research and development for the next generation of low-carbon technologies. This will require significant targeted public investment.

Box 1. Some proposals for carbon capture and storage (CCS)

CCS in emerging countries. China and Brazil are actively developing pilot projects. India, Russia and South Africa could be also key partners.

CCS in the CDM. There have been ongoing discussions in the UNFCCC on eligibility of CCS activities under the CDM, facing resistance by a small number of countries. This question also leads to Annex I Parties' ability to use CERs from them for their compliance with commitments. The IEA put forward a set of suggestions including the approval of a pilot phase of CCS in the CDM, development of a targeted mechanism to finance CCS technology (and knowledge) transfer post-2012, and development of bank financing for portions of projects. These moves could help to create an enabling environment even though a carbon price is viewed as a prerequisite for CCS.

CCS in the EU-ETS. Up to 300 million EUAs will be available from new entrants' reserves until the end of 2015 to co-finance construction of 12 CCS demonstration plants (Article 10a. 8, the EU-ETS Directive).

CCS in the Green Investment Scheme (GIS). There is a suggestion to use the GIS to finance CCS demonstration projects in Central and Eastern European countries.

CCS certification/CO_2 storage certificate. This scheme delivers a (tradable) certificate for one tonne of CO_2 stored underground and supports the CDM.

1.4 Scaling up finance

The European Commission estimates that by 2020 developing countries are likely to face annual costs of around €100 billion for mitigation and adaptation and that between €22-50 billion will be needed annually for international public finance to pay the costs by 2020: the EU will contribute €2-15 billion annually, and the international carbon market will provide up to €38 billion annually (European Commission, 2009c and d).[5]

Since the negotiations of the Kyoto Protocol, the magnitude of the challenges confronting countries – such as long-term emissions reductions

[5] There is a wide variance in estimates about the scale of finance needed in the mid-term, depending on assumptions (see e.g. Carbon Trust, 2009).

and technology diffusion – has increased the need to establish an appropriately robust financial architecture. The financial architecture would define the respective roles for both the public and private sector and integrate them. The architecture would also provide different types or sources of financing for different areas in need: for example, carbon market finance for diffusion or deployment of technology to be complemented by targeted public investment in research and development.

Flexible mechanisms have a potential to leverage private investments. CERs and ERUs, which were valued at $4.5-8.5 billion per year in 2007-08, are estimated to leverage ten times the overall private investment of $45-85 billion per year (UNFCCC 2008). The leverage of the CDM alone will be discussed in section 2.1.1 below.

Moreover, flexible mechanisms can be regarded not only as a vehicle for international cooperation in facilitating a deal but also as a catalyst to re-direct financial and investment flows to a range of mitigation opportunities across sectors and activities. There remain a number of untapped mitigation opportunities. Some opportunities are considered to incur excessive incremental costs (e.g. CCS) while others appear to remain under the economy of scale (e.g. improvements in energy efficiency or transport). In addition there is a lack of incentives for energy efficiency on both the demand and supply sides. New mechanisms can take advantage of opportunities that are left outside the coverage of existing mechanisms, for example a cap-and-trade scheme such as the EU-ETS.

For developing countries, it is important that existing and new mechanisms allow growth and development to continue in a robust and environmentally-sound manner through incremental investment from Annex I countries and businesses. They should also lead to credits that are redeemable in the external market.

2. LESSONS FROM EXISTING MECHANISMS

To date most of the experiences in flexible mechanisms come from the clean development mechanism (CDM). In 2008 transactions by the (primary) CDM recorded 389 $MtCO_2e$ in volume compared with JI at 20$MtCO_2e$ and $6,519 million in value compared with JI at $294 million (Capoor & Ambrosi, 2009). The CDM has dominated transactions under the flexible mechanisms in both volume and value, benefiting from its earlier start than other mechanisms. Although there have not been many projects from JI, they have produced some lessons. The year 2008 also marked the start of a few large trades of AAUs, some of which involve conditions for 'greening' in a Green Investment Scheme (GIS). Box 2 summarises the characteristics of the CDM and JI.

Box 2. Characteristics of the CDM and JI

- *Cost-effectiveness.* They provide for cost-effective emissions reductions in host countries, and reduce the overall cost of complying with Annex I countries' emissions reduction requirements. However, there are issues on administrative costs and unpredictability about the timelines for registration, issuance and approval.
- *Technology transfer.* They promote transfer of technologies to reduce emissions in host countries.
- *Co-benefits.* These projects often have considerable side benefits in the form of reduced emissions of other pollutants as well as social, health and economic benefits.
- *Financing.* These projects provide private financing to emissions reduction projects in non-trading sectors. The most significant feature is that the financing, predominantly private, is mostly provided directly to the projects, and not through an intermediary at host country level.

Experiences in both the CDM and JI resulted in some achievements as well as difficulties with specific issues. Some are considered to require continuous discussion (e.g. ensuring additionality and governance), whereas others have led to immediate actions for improvements, e.g. scaling up the CDM through the Nairobi framework and Programmes of Activities (PoAs) or extended use of benchmarks, e.g. submission of a sectoral benchmarking methodology for the cement sector.

2.1 CDM

The CDM was established under the Kyoto Protocol as a means of stimulating sustainable development and allowing Annex I countries to meet their national targets by acquiring lower-cost carbon emissions reductions from projects in non-Annex I countries.

2.1.1 Achievements

The CDM should be evaluated against what it was meant for, namely, to support sustainable development and to generate credits for Annex I countries. The CDM is the most frequently used among the flexible mechanisms and the only one to engage both developing countries and the private sector. The CDM opened up a way for developing countries to enter a carbon market, requiring only minimal domestic capacity and institutional set-up.

The CDM is generally seen as a success, especially by developing countries. According to data published by the UNEP RISØ CENTRE, as of 1 November 2009, the CDM had more than 4,700 projects in the pipeline.[6] It is estimated that up to 1.3 billion CERs could be issued before the end of 2012 and 5.8 billion CERs during the period 2013-20 (Capoor & Ambrosi, 2009).

There are a number of factors explaining the success of the CDM. First, through the process, participants learned about methodologies and accounting for greenhouse gases. Second, the CDM has attracted the active participation of the private sector. Table 1 showed the engagement of the private capital in Annex I/B countries. The CDM has triggered large-scale private investments. It is estimated that the CDM has benefited about €75 billion ($106 billion) of overall 2002-08 investment in projects that reduce

[6] http://cdmpipeline.org.

GHG emissions for an average leverage ratio of 4.6 whereas if industrial gas projects were excluded, the ratio would have reached 6.5 (Capoor & Ambrosi (2009).[7] Moreover, the CDM market grew as a result of a decision to allow unilateral projects: this option enables local entities in developing countries to implement projects according to their own priorities, and look for the best buyer. Third, an appreciation of the real costs and opportunities of carbon contributes to an increased awareness among participants and the public, also in countries where the government has not had any GHG regulation in place. This also means that it is easier for governments and companies in developing countries to see mitigation as a business opportunity. Lastly, a 2% levy on the proceeds from the CDM to finance the Adaptation Fund was one of the early attempts to set up a fund sourced from a portion of emissions allowances.

2.1.2 Areas for discussion

Despite significant achievements, there have been calls for change (see e.g. Olsen & Fenhann, 2008) in the way the CDM operates concerning the uneven distribution of projects, under-representation of sectors or project types, additionality, administrative and organisational issues, windfall profits in certain low-cost projects, interpretation of sustainable development, pure-offsetting and technology transfer. These specific concerns are discussed below.

Uneven distribution of projects

One of the most discussed areas is the concentration on or inequitable distribution of projects among project types, sectors and countries. For example, four countries account for more than 80% of all CDM projects. China alone accounts for 59% of expected average annual CERs from registered projects by host party, followed by India (11.27%), Brazil (6.45%) and the Republic of Korea (4.59%).[8]

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[7] For the methodology for computing investment and leverage factors, see Capoor & Ambrosi (2007).

[8] See http://cdm.unfccc.int/Statistics/Registration/AmountOfReductRegisteredProjPieChart.html

This concentration is not limited to the CDM but occurs in any market mechanism. There are a number of possible reasons to explain the phenomenon. The most clear-cut projects were the ones where methodologies were developed first. Once a methodology is approved it can be used by anyone.

What is commonly termed as 'concentration' or 'inequitable distribution of projects' could also result from relative attractiveness of host countries, which may not be necessarily limited to CDM projects. To some extent project distribution is a natural consequence of a market mechanism. Markets do not choose host countries and cannot be held accountable for the result. Participation in the CDM is voluntary, therefore there is a limit to what can be done to promote wider distribution beyond changes to design elements. Then, the next step would be to consider how to soften the natural consequences of a market mechanism by improving access to the CDM by under-represented countries.

Sectors not suitable for project-based crediting

In some cases the CDM may have done so well in financing emissions reductions in developing countries that some say it has exhausted low-cost opportunities under existing approved methodologies. It has been suggested that the more advance developing countries have been quickly materialised and monetised their low-cost mitigation potentials ('low-hanging fruits') through CDM projects, e.g. HFC and N_2O projects. In other cases of low-cost opportunities such as demand-side energy efficiency, the potential has not been fully harvested. There has been a claim that it is difficult to capture mitigation potential in some sectors with dispersed emissions sources. This poses particular methodological challenges, and monitoring requirements incur high transaction costs, but yield a relatively low volume of CERs.

Energy efficiency and transport do not account for a large share of CERs. Demand-side energy efficiency and transport have particular difficulties in the CDM since their potentials are not easily made into 'projects'. Supply-side energy efficiency takes 11%, while demand-side energy efficiency accounts for only 1%.[9]

[9] According to http://cdmpipeline.org

Differentiation

Today, a CDM project can be undertaken in any non-Annex I country that is a party to the KP and fulfils the eligibility requirements. In future all parties, project types or technology types[10] may not need to be treated exactly the same. Nonetheless, all emissions reductions are important in the sense of reducing GHGs in the atmosphere irrespective of where they take place. In order to politically encourage reductions in certain applications or manage the 'emissions-reduction supply-demand' balance, discounting of certain projects has been proposed as a tool. It is important to stress that this could lead to economically less efficient economic solutions. Therefore it could be applied as a temporary instrument and subject to review to assess the intended effect (e.g. the Nairobi Framework, see below).

There could be at least three approaches to differentiation: preferential treatment, eligibility criteria and a discount or a premium rate (Bakker et al., 2009; Schneider, 2008). First, it is possible to allow preferential treatment in procedures, access to resources (e.g. specific funds for project financing) and methodology (e.g. use of ambitious benchmarks, removal of an additionality test, a simplified additionality test, allowing use of conservative default values, sampling in monitoring, etc.). Second, there are different types of eligibility, e.g. for potential sellers to host projects or for potential buyers to use CERs for compliance. More specifically, this often means drafting a positive or negative list of project types. Third and lastly, there are quantitative methods including a discounting rate and a premium rate: the former refers to a formula in which one tonne CO_2eq equals less than one CER; and the latter to a formula in which one tonne CO_2eq equals more than one CER. Discounting would distort the market and risk undermining incentives for project development and investment in developing countries. A premium could serve as an economic incentive for project development and investment that could deliver, for example, sustainable development benefits.

[10] Projects or credits earned from the projects can be treated differently according to countries (e.g. mitigation costs relative to GDP, weighting under-represented regions), project types (e.g. sustainable development benefits, benefits to the atmosphere), technology types (e.g. renewable electricity) or technological or financial requirements (see e.g. Bakker et al. 2009).

Some elements of differentiation are already taking place under the current rules. A premium, reflecting willingness to pay, has been observed among CER buyers, e.g. the premium by the CDM Gold Standard. Among the examples of supply side differentiation are the exclusion of some project types, the exclusion of Least Developed Countries (LDCs) from the CDM levies and allowing simplified procedures for small-scale projects.

An example of a more comprehensive approach is found in the Nairobi Framework launched in 2006 and aimed at increasing Africa's share in hosting CDM projects. About 80 countries entered the CDM pipeline with some newcomers from sub-Sahara Africa and the Middle-East joining in 2008 and early 2009 (see Capoor & Ambrosi, 2009).[11] Moreover, one attempt has been made in the EU's effort-sharing Decision (European Union, 2009b) targeting the 2013-20 period and granting favourable treatment for projects in LDCs/Small Island Developing States (SIDS). Still, that in itself is not enough to bring about projects in these countries.

Additionality

Additionality refers to reduction in emissions that would not have occurred in the absence of a CDM project. Additionality is a counterfactual concept, once a project goes ahead it is no longer possible to know what would have happened in the absence of the project. For example, industry gases like HFCs/N_2O can be easily certified as additional to baseline. However, even if a project can clearly demonstrate additionality, there might be objections to it being approved as a CDM project: for example, due to the potential impact of increased and unnecessary HCFC-22 production on ozone depletion. Ambiguity over additionality itself as well as rules that are open to interpretation and reinterpretation bring about delays and increase transaction costs. The impact of ambiguity over additionality, significantly varies from one project type to another: as a share of total projects with a request for review due to additionality, wind power and hydro power scores stand out, accounting for 89% and 88% respectively.[12] Consequently there has been an interest in alternative, more conservative and simpler ways to address the issue of additionality (e.g. benchmarks, see below). The

[11] See http://cdm.unfccc.int/Statistics/index.html

[12] D. Agostini, presentation at the CEPS Task Force meeting, 14 January 2009 (see http://www.ceps.eu/taskforce/cdm-and-post-2012-flexible-mechanisms).

question then is at what level to balance the environmental integrity with ease of the process.

Administrative and organisational issues

It has been argued that the CDM has become administratively cumbersome. There are concerns about delays in registration and issuance partly attributed to the additionality requirement, resulting not only in higher transaction costs but also in losses in supply of CER volumes as well as the monetary loss of CER revenues, which pose additional risks for investors and developers. In September 2009, the UNEP RISØ Centre reported that the average issuance delay for projects with CERs issued is 13.2 months while the average issuance delay for registered projects without issuance is 15.7 months. About a quarter of the 1,245 registered CDM projects without issuance experienced an issuance delay from 24 to 48 months.[13]

Partly due to the mechanism's own success and popularity, it is also noted that projects recently entering the pipeline, which are increasingly hosted in poorer countries, have been subject to a longer wait and a lower success rate. This suggests that the current system is overstretched to cope with the inflow of projects waiting for decisions by regulatory bodies. Another concern is the lack of predictability in the regulatory framework, with confusion surrounding the timelines for registration, issuance and approval.

Windfall profits or over-payment in certain low-cost projects

Profit-making itself is the rationale behind market instruments such as the flexible mechanisms. The prospect of potential profits serves as a driver for action. Investors primarily seek to maximise returns for minimum risk within the given set of rules and time frame and also show interest in cost-effective opportunities. There has been a concern about the extent to which mitigation costs have been compensated by credits generated from certain low-cost projects like industrial gas (e.g. HFC, N_2O) projects. One might even suggest that the difference between the EUA price and the abatement cost in developing countries has created economic rents to developers of CDM projects. On the other hand the principle of marginal prices and the

[13] http://cdmpipeline.org

benefit they give to the lowest-cost producer are well accepted in other markets.

It has been concluded that HFC and N_2O projects are clearly additional and therefore meet this criterion of the CDM. However, the above concern could be softened by addressing at least two questions: Should these projects receive only a limited number of CERs? Should CERs from such projects be taxed (as it is done in China), and the tax revenue be used for sustainable development in order to compensate for the shortcomings resulting from the projects.

Decentralised interpretation of sustainable development

In the Marrakesh Accords, Parties agreed that countries define their own sustainable development criteria in accordance with national priorities. Consequently there is a wide spectrum of interpretation as to what constitute sustainable development benefits. And even once defined, it is difficult to measure and quantify the sustainable development benefits.

Offsetting

It has been claimed that the current CDM is almost pure-offsetting (see e.g. Höhne & Ellermann, 2008). CERs represent emissions reductions proven to have taken place in non-Annex I countries but sold to either an entity in an Annex I country for part of its compliance with domestic legislation including the EU-ETS Directive, or an Annex I country's government for part of its compliance with the Kyoto Protocol. In other words, the rules allow these buyers to overshoot their emissions caps or targets but use CERs to compensate for the overshoot, hence the term 'offsetting'. Given the (lack of) progress in Annex I countries' achievement relative to the Kyoto targets, there has been a growing call – particularly from the EU – to phase out the current CDM as pure-offsetting.

Technology transfer

While studies report some progress in technology transfer (see e.g. Haites et al., 2006 and de Coninck et al., 2007), a number of developing countries have indicated that the CDM does not lead to technology transfer as defined under Article 4.5 of the UNFCCC. However, technology transfer was never meant to be the primary objective of the CDM, as agreed in the Protocol. In addition the operation period of five years (2008-12) for the CDM is too short to achieve the full effect of technology transfer. On the other hand, the CDM could encourage investments in commercially

available low-carbon technology mainly in energy supply and industry as well as potentially in the waste sector.

2.1.3 Areas for ongoing improvement

Most of the above discussion points have been already addressed in the UN processes. In response to additionality requirements, efforts have been made to create new categories as the basis for crediting, expanding the scope of activities beyond individual projects to programmes or sectors.

Programmes of Activities

With the aim of expanding the scope of the CDM beyond projects, a new framework has been introduced, known as Programmes of Activities (PoAs), using the existing CDM infrastructure. It increases the possibility to register a set of activities of the same type in a wide area under a single 'programmatic' umbrella. The rationale behind it is to enhance the efficiency of the operation process, and increase its applicability as well as the volume of credits. It is also expected to facilitate access on the part of countries without a track record to the CDM by allowing the re-grouping of single projects that would otherwise be too small to be commercially attractive or viable. Nine PoAs were at the validation stage in April 2009, focusing on efficient lighting, solar heating and waste management, and two new PoAs were submitted in August. For example, Mexico has prepared a national light-bulb replacement programme. India has recently announced a similar programme and submitted a new project on promotion of biomass-based heat generation systems.

Sectoral benchmarking in the CDM

Sectoral benchmarking in the CDM establishes a dynamic baseline based on a pre-determined benchmark (e.g. for emissions per tonne of production) for a whole sector (e.g. cement, power and steel have been suggested) or sub-sector in a country or a region. Sectoral benchmarking in the CDM ensures environmental integrity as well as predictability by demonstrating additionality and setting the baseline with stringent and differentiated pre-determined benchmarks. An example of 'top of the class' benchmarking can be found in a recent CDM methodology for refrigerators. In another example, the World Business Council for Sustainable Development Cement Sustainability Initiative (WBCSD-CSI) has been developing a benchmarking CDM methodology for the cement

sector based on 1) a cement standard CO_2 protocol to allow comparison of 'like for like' and 2) the established database, 'Getting the Number Right (GNR)'. The methodology was submitted to the Executive Board in April 2009. In this methodology the benchmarks are expressed in the emissions carbon intensity per cement or clinker tonne in a given region and are used to calculate baseline scenario emissions and to demonstrate additionality. The environmental integrity is enhanced due to the dynamic nature of the baseline, adjusted for BAU (business as usual) improvements. This methodology has been tested in existing CDM projects, and further developed incorporating feedback from stakeholders before submission to the Executive Board.

Sectoral benchmarking for baseline setting (and to assess additionality) can be done regionally or globally depending on parameters. It should be noted, however, that many developing countries view benchmarking as a form of 'international standardisation' against which their business sectors could be judged. Sectoral benchmarking in the CDM will be likely to start in advanced developing countries because of its orientation towards the economic structure in the energy, industry and transport sectors.

2.1.4 Lessons

The CDM has made a number of important achievements: GHG emissions reductions and sustainable development benefits in non-Annex I countries, first steps towards MRV and GHG accounting, attracting the participation of the private sector, encouraging investment flows to developing countries, raising awareness of abatement opportunities among participants and the public and generating revenue for adaptation actions. Areas for further discussion include the uneven distribution of projects, preferential treatment for LDCs, additionality, administrative and organisational issues, offsetting and technology transfer. Ongoing improvements are being introduced in two areas: Programmes of Activities (PoAs), and sectoral benchmarking in the CDM.

2.2 JI

The Kyoto Protocol created Joint Implementation (JI) in parallel with the CDM to finance projects aimed at reducing GHG emissions in Annex I countries. JI is designed for use in Annex I countries with capped GHG emissions: all emissions reductions transacted under JI are controlled by a legally binding obligation attached to an AAU by each party to the Kyoto

Protocol. Hence JI has the potential to be more flexible in its design than the CDM, since JI re-distributes emissions reduction units (ERUs) under a cap. Despite this fundamental difference between the mechanisms, the methodologies and procedures developed for the CDM have been in practice adopted for JI as well. It is important to mention that JI is not limited in scope as any emissions reduction/sinks enhancement activity can be credited if it is 'additional'.

JI is actually a two-track mechanism:

- The so-called 'Track I' is supervised by the UNFCCC only at a macro, country level: it is a bilateral agreement between two Annex I countries. If those two countries are eligible, they may determine emissions reductions generated by JI projects and transfer the corresponding amount of Emissions Reduction Units. Countries eligible to track I are also eligible to track II.
- The so-called 'Track II' is supervised by the UNFCCC at a micro level, on a project-by-project basis. The Joint Implementation Supervisory Committee (JISC) is the UN body that supervises the mechanism. It may give greater certainty to the investor since reductions under a Track II project are valid even if the host country as a whole does not meet its obligations.

Track I could provide a more simplified procedure and greater flexibility in scope and process. However, it could also result in less consistency and less transparency than the Track II because processes can potentially differ from one country to another, projects are not governed by the JISC or verified by a third party, and the market may not perceive one ERU to be equal to another ERU. ERU transactions under Track I are similar to AAU transactions.

2.2.1 Achievements

As of 1 November 2009, a total of 243 JI projects have entered into the pipeline. Some 179 Track II projects and 64 Track I projects are in the pipeline. Some projects have moved from Track II to Track I.[14]

By project type, renewables account for most of the number of JI projects, but CH_4 reductions (mainly reduction of losses in natural gas

[14] http://cdmpipeline.org

pipelines) account for most of the ERUs. By country, Russia and Ukraine host most of the JI projects: Russia hosts 107 JI Track II projects but no Track I project; Ukraine hosts 27 projects under Track II and 7 under Track I.[15]

2.2.2 Areas for discussion

There are a number of reasons why a limited amount of JI projects have been approved for the time being by the JISC or Track I countries:

- Limited understanding of the specificities and benefits of JI on the part of potential host countries, which include not only Russia, Ukraine, Belarus and the EU's newest member states, but potentially all Annex I countries; therefore there has been little activity in setting up procedures, rules and methods, providing guidance to project developers, and deciding on projects.
- Delays in approval of projects by host countries, especially Russia.
- The JISC has promoted more stringent additionality procedures than market participants expected, spilling over from CDM methodologies. This, combined with late and somewhat unclear guidance on JISC rules and procedures, has resulted in the need to reformulate many early JI projects;
- Delays in establishing approval procedures and other bottlenecks e.g. small number of Accredited Independent Entities (AIEs) and important delays by the independent entities in finalizing determinations of Project Design Documents (PDDs);
- Limited possibilities in eligible and interested JI host parties (EU member states) after the implementation of EU ETS;
- Lack of flexibility shown by JISC in respect of the around 150 world-wide JI so called "early mover projects" (some of them are still waiting track I registration);
- A short crediting period combined with uncertainty about JI beyond 2012 also has impeded the broad use of JI. The current JI crediting period is shorter than that of the CDM and does not match an investment cycle especially for large-scale investments in the energy

[15] Ibid.

sector planned in coming decades. Extension of a JI crediting period aligning with the CDM can be considered.

Some issues like additionality requirement and subsequent regulatory delays are similar to CDM issues.

2.2.3 Areas for ongoing improvement

Some progress has been made in baseline setting and expansion of the scope to programmatic and sectoral JI, which are similar to CDM issues.

JI baseline and benchmarking

JI Track II may apply an approved CDM baseline methodology or develop its own approach. In the latter case there is a need to provide a clear guidance for how to describe the baseline emissions. The JISC has developed a Determination and Verification Manual (DVM) including guidance for baseline setting, monitoring, additionality etc.

As reductions from JI projects are backed by the AAUs, the case can be made for – in principle - simplifying the requirements for additionality and baseline setting. There is a question about who has competence to determine additionality and baseline criteria. Baseline criteria could be set out in a generic manner based on historical emissions of an existing installation or comparison with newly implemented installations not applying JI activities.

Sectoral and Programmatic JI

Binding sector targets would further stimulate the reduction of emissions from key sectors in countries hosting JI projects and complement national targets. Reductions below the binding sector targets can be traded, thus providing an incentive to reduce emissions below the target. Interestingly, sectoral JI is feasible under the existing regulatory framework, but no host country has implemented a sectoral JI project so far.

Similarly, programmatic JI can be a cost-effective mechanism of achieving emissions reductions from sectors with diffused emission sources that are otherwise difficult to mitigate (e.g. reducing heat losses in district heating systems). The JISC is actually preparing guidance on such projects under JI Track II procedure. It is reported that the first programmatic JI projects have been registered in Germany.

2.2.4 Lessons

Simplification of procedures and relative flexibility in scope and process contributed to a considerable increase in the number of JI projects under the Track I. Some areas for discussion and ongoing improvements are similar to those under the CDM: simplification of baseline setting and potential expansion of the scope to sectoral and programmatic JI.

2.3 AAUs trading and the GIS

The Kyoto Protocol allows international emission trading (IET) (Assigned Amount Unit (AAU) trading) between Annex I countries. Because of the number of AAUs initially allocated to 10 EU member states in Central and Eastern Europe (EU-10)[16], Ukraine and the Russian Federation for the first commitment period, trade in AAUs with these countries without a specific, dedicated underlying emission reduction activity is often considered 'hot air' trade.

The design of AAU trading has been left to participating Annex I countries. One form of AAU trading is the Green Investment Scheme (GIS), which was introduced as an attempt to enhance the environmental integrity of the AAU trading. The GIS aims to combine a transfer of AAUs with an activity that has a positive effect on GHG emissions reductions and is financed with revenues from selling surplus AAUs.

In 2008 and early 2009, there were several transactions (four in 2008 and five in early 2009) of about 90 million AAUs, totalling in value some €0.91 billion ($1.2 billion)(Capoor & Ambrosi, 2009). Hungary sold 2 million AAUs for 'hard greening'[17] to Belgium and 6 million in a similar transaction to Spain (Point Carbon, 2009). It is reported that Japan concluded and published greening guidelines as an annex to AAU

[16] 12 new member states acceded to the EU in 2004 and 2007 except Malta and Cyprus.

[17] The World Bank (2004) proposed two concepts of greening: 'hard greening' refers to the case in which "an AAU is greened when the activities financed through the proceeds of the sale have generated one unit of emission reductions measured against a baseline scenario describing what would have happened in the absence of the greening activity"; and 'soft greening' is defined as "the effective implementation of certain pre-defined activities" such as implementation of a demand-side management programme, dismantling of energy subsidies, capacity-building activities related to climate change and activities for managing the GIS.

purchase agreements with the Czech Republic, which set a GIS in place. These guidelines list types of environmental measures to be financed and describe broad eligibility criteria (see Peszko, 2009).

There are no international legal regulations regarding the GIS and thus the way the scheme can be set up is flexible, depending on how the buyer and seller countries formulate a transaction. The success of this formula crucially depends on the credibility of the host country's pledge to implement actions, ranging from allocation of revenues to the designated activity to monitoring and verification of greening. Increased transparency in AAU transactions is a key element in the GIS.

It is likely that the GIS will largely remain government-to-government transactions where the private sector plays a limited role for a number of reasons, including the fact that the EU-ETS Directive does not allow the covered installations to use AAUs as part of their compliance. Moreover, companies cannot easily engage in transactions with governments, or there will be the question of liability for project failure or non-delivery of emissions reductions.

Since the concept has only recently been tested in practice, yielding limited experience, it is too early to draw lessons from what has happened. However, some potential host countries have difficulty in competing with other market mechanisms in parallel. In particular, the EU-10 faced the risk of double-counting between schemes in place as well as the limits on capacity and resources for setting the GIS infrastructure.

3. MECHANISM OPTIONS IN THE FUTURE

While recognising the importance of other mechanism options, this Task Force report focuses on four potential future flexible mechanisms (the reformed CDM and JI and sectoral crediting and sectoral trading). Like existing mechanisms, all future mechanisms would aim to contribute to advancing climate objectives, i.e. real global emissions reductions and possibly other specific objectives such as sustainable development, technology transfer and financing. They can all benefit from the lessons learned from existing mechanisms and be developed into instruments supporting the architecture of a new climate change regime. Box 3 summarises the potential benefits of the CDM and JI beyond 2012.

Box 3. Potential benefits of the CDM and JI beyond 2012

- *Increase the scope and incentive for today's non-Annex I Parties to become Annex I Parties.* In the future, JI could allow for the rolling over of CDM projects from an un-capped to a capped environment for developing countries that wish to become Annex I parties or agree to take on binding (sector) targets.
- *Provide an incentive for Annex I parties not yet linked to ETS.* A continuation of JI would also provide a mechanism for continued financing of projects in countries like Russia, Ukraine and Belarus as well as potentially new Annex I parties – countries where the institutional framework for linking to an emissions trading scheme is not yet fully developed.

In some countries the CDM could be converted to operate in a capped environment, equivalent to JI. JI could achieve emissions reductions in

sectors not covered by a domestic emissions trading scheme, which has been the case in the EU-10. While such a vision would help to explore possible directions of future mechanism options, the immediate focus of both the CDM and JI beyond 2012 is placed on administrative and governance issues. A number of ideas for the CDM or JI beyond 2012 were presented in chapter 2.

In contrast sectoral crediting and sectoral trading remain largely conceptual at this stage. Thus, the emphasis here will be placed on illustrating what it is, how it will work and what are remaining questions for each sectoral option. One should keep in mind that sectoral crediting and sectoral trading are unlikely to work side-by-side in a single sector.

3.1 CDM reform and beyond

Expansion of the scope to sectoral and programmatic activities would help to scale up private investments, develop the carbon market and create more opportunities for emissions reductions. It should be noted that a deal including 'sectoral targets' may lead to new challenges for the CDM. In either case the anticipated increase in new CDM projects or issuance of CERs would require improvements in the efficiency of administration and an increase in the transparency of governance. To manage the anticipated increase in projects, it is necessary to improve the flow of the registration and issuance process without losing any necessary rigour inherent in the procedures that assures the system. Proposals for governance reform (IETA, 2008) include the assessment or review of the existing capacity and procedural efficiency of CDM-related regulatory bodies including the Executive Board, assurance for a clear definition of roles and responsibilities of these bodies, reproducibility and predictability in decision-making and the establishment of an appeals procedure for third parties. Parties have been invited to provide the CDM with a governance structure, management systems and guiding principles. In so doing, it is important to look at the support structure that underpins the work of the Executive Board (EB), such as the role of the Secretariat, the Registration and Issuance Teams (RITs) and the Designated Operational Entities (DOEs). It is claimed that the majority of registration and issuance problems can be traced to the lack of 'due process' within the CDM; however, what is less clear is where the process actually fails. In some cases, problems arise from EB decision-making and time constraints, in others, from RIT or Secretariat resource constraints while in others market-

driven testing (for project approval) or a lack of DOE resources can present obstacles. Another source of registration and issuance problems is the difficulty in implementing effective additionality criteria. Efficiency, predictability, consistency and transparency are important guiding principles of good governance, which is essential for a successful CDM. The inherent challenge associated with the CDM being a financing mechanism requires additional transparency. It is critical, as has been recognised for the EU-ETS, that project assessments are kept separately from the regulator.

3.2 JI reform and beyond

There are issues to be addressed, similar to those in the case of the DCM, in order for JI to become an optimally functioning mechanism. These include administrative and organisational issues pertaining to the Joint Implementation Supervisory Committee (JISC) as well as more technical issues such as baseline setting and methodology choices. These steps do not require changes in the text of Article 6 of the Kyoto Protocol and could be formulated within a COP/CMP resolution, i.e. at COP15 in December 2009. There is a need to improve the governance, efficiency and transparency of JI in both Track I and Track II. This calls for the removal of bottlenecks, strengthening of the JISC and obtaining cooperation from host countries for simplification of procedures.

At the same time, the role and scope of JI after 2012, including new important JI actors being transformed from non-Annex I to Annex I countries and thereby moved from the CDM context to the JI context, are fundamental issues to address. In the future, as more and more countries and sectors are expected to commit to GHG limitation and reduction, the role of JI may change and increase substantially.

There are several possibilities to include incentives in JI that could help other countries take on binding reduction targets. JI today encourages a country to attract capital for investment in climate-friendly technology by offering a payback via crediting (ERUs) of the emissions reduction for a certain period. After this period, the benefit of the investment will contribute to the national targets. During the crediting period, the benefit goes to the investor, so the country must rely on other measures to reach its overall national reduction target.

3.3 Sectoral crediting

Unlike the CDM, a sectoral crediting mechanism credits emissions reductions from a covered sector against a threshold possibly below the business as usual scenario. Sectoral crediting based on no-lose targets intends to encourage emissions reductions (orchestrated by the host country) in a key emitting sector in developing countries. It could set a price signal for a broader part of the economy, including power and key industry sectors. Box 4 shows key elements of the EU proposal for a sectoral crediting mechanism. There will be no penalty for failing to reach a target or to implement it, hence the term 'no-lose'. A baseline will be negotiated as part of an international agreement (Ward et al., 2008) or be domestically set on the basis of sectoral benchmarks (CCAP et al., 2008). The baseline could be expressed in absolute emissions levels, the carbon intensity (e.g. CO_2 emissions per unit of output) or technology penetration rates. For baseline setting it is worth mentioning that many of the industries to be covered are either owned or operated by governments.

In practice developing countries first propose to implement policies and measures in key sectors that could move the emissions trend well below the BAU. Host countries will finance these policies and measures themselves while receiving a negotiated package for technology and financial support through public finance from developed countries. And on top of that, they could expect revenues from the sale of their credits on international carbon markets.

A technical merit of sectoral crediting is its circumvention of the additionality test on a project basis. Sectoral crediting assesses the performance of a whole sector instead of individual activities, although monitoring will still need to be performed at an installation level for aggregation into a sector level.

Credits for emissions reductions below the baseline are issued ex-post and can be sold on international carbon markets. One open question is whether credits should be issued directly to companies in sectors or channelled through the government. There are two important aspects of this question. First, how can one ensure that the price signal set at the international level would be passed on to firms operating in the country? Second, how can one ensure that the private sector will be fully engaged, for example through benchmarking exercises or through participation in a domestic emissions trading scheme? This uncertainty raises a serious question about its ability to leverage private investments on a greater scale

and in a longer term. For potential sellers it would be essential to directly receive emissions reduction credits whose value can be internationally recognised, and which would enable them to participate in the international carbon market and raise revenues there, for example, to purchase low-carbon technology or equipment for further reductions.

A scenario under which companies in an Annex I country have to purchase credits in order to operate or produce products whilst companies based in a non-Annex I country receive free allocation or are given 'no-lose' targets (and saleable credits) has the potential to damage international competitiveness, particularly that of the energy-intensive industry based in an Annex I country.

Box 4. Key elements of the EU proposal for a sectoral crediting mechanism

The new mechanism aims:

- To introduce a more comprehensive and wide-ranging price signal, i.e. a price that reaches individual installations in a particular economic sector;
- To have a greater environmental ambition level and move beyond the pure offsetting nature in the current CDM;
- To be administratively less cumbersome and give rise to lower transaction costs than the project-based CDM;
- To initially concentrate on the power sector and those economic activities that are subject to global competition, e.g. steel, cement and aluminium;
- To earn credits against an ambitious technical benchmark per sector and
- To facilitate a move to a comprehensive multi-sectoral cap-and-trade system.

Source: European Commission (2009a and b).

There are several challenges. First, it has been argued that there are not so many sectors that would suit this mechanism, if the scope is primarily aimed at industry sectors. However, broadly speaking, the scope of sectoral crediting could cover three main sectors: electricity generation,

industry (e.g. cement, aluminium, iron and steel) and other sectors subject to 'policies and measures' (e.g. transport).[18] Second, baseline setting would need to take into account specific circumstances of a country, sector, or technology since one approach or method does not fit all national or sectoral circumstances, hence, 'one size does not fit all'.[19] The third challenge is capacity-building. The most advanced developing countries can benefit from the scheme not only because they have developed key industry sectors that are targeted but also because they possess the technical capacity and data required. There has been an attempt to use sectoral proposal templates as a capacity-building tool.[20] The fourth challenge is institutional set-up (see Schneider & Cames, 2009).[21] Given that sectoral crediting relies on high-quality data and information about technologies, cooperation between governments and industry is crucial. The latter could facilitate benchmarking and data collection, ensure the high standard of MRV (measurement, reporting and verification) and advise on national implementation process.

Moreover, it is not clear at this stage what role the private sector can play in sectoral crediting and how to create incentives for their participation. In addition, it would be important to consider ways to reduce or share risks for private investors.

A few remaining questions are how to avoid possible confusion between sectoral crediting as a new mechanism and sectoral benchmarking in the CDM and whether sectoral crediting based on no-lose targets can co-exist with the current CDM or other flexible mechanisms. There is a risk of

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[18] See e.g. the study on sectoral approaches financed by the European Commission (DG Enterprise), http://www.ccapeurope.org; Baron et al. (2007); IEA (2009) and Amatayakul et al. (2008).

[19] D. Klein, "Data issues in sectoral approaches", presentation at the Tokyo workshop as part of the study on sectoral approaches, 25 February 2009 (http://www.ccapeurope.org).

[20] M. Jung et al, "Sectoral Proposal Templates: Overview and lessons learned", presentation at the Brussels workshop as part of the study on sectoral approaches, 17 September 2008 (see http://www.ccapeurope.org).

[21] One idea is to use existing bodies such as the CDM regulatory bodies (e.g. EB, DOE, Designated National Authorities (DNAs)). Another idea is to establish a new body represented by both governments and industry.

double-counting between an existing local CDM project and a new project for sectoral crediting. One solution would be to deduct the number of CERs issued to the local CDM project from those issued to the sectoral scheme; another would be to prohibit the implementation of such local projects (Sterk, 2008). Sectoral crediting could be seen as a parallel initiative to JI and the EU-ETS. Another question is how the mechanism will be structured to encourage upfront private sector investment.

3.4 Sectoral trading

Sectoral trading refers to a cap-and-trade scheme applied to a whole sector or a sub-sector within a country (e.g. an ETS for aviation), and in this respect it can be regarded as a step beyond sectoral crediting based on no-lose targets towards an economy-wide cap-and-trade. Such a move can be done by gradually tightening the negotiated baselines and converting them into absolute caps. If the baselines are already expressed in absolute terms, such a conversion would be technically easier.

Sectoral trading aims at addressing countries that are not yet ready to take on binding national targets but are prepared to take on binding targets in key sectors, such as power and industry. Emissions allowances will be allocated to the host country's government, reflecting binding sectoral targets. Governments will be responsible for reducing emissions in particular sectors to a pre-determined level. This level would be the basis for cap-setting in a domestic sectoral trading scheme. The government will then decide how to allocate emissions allowances within the relevant sector. If the government has taken on a binding target for the sector, the sectoral cap-and-trade scheme would be mandatory in principle. There are a number of challenges: for example, boundary setting and consideration of specific circumstances of a country, a sector, or a technology in baseline setting. Presumably the industry structure and boundary may vary from country to country, as pointed out in the context of sectoral crediting.

4. OBJECTIVES OF FUTURE MECHANISMS

Future mechanisms should be able to meet a number of objectives. They could help to address outstanding problems (e.g. competitiveness and leakage; transparency and accountability in governance; equity) while enhancing the strengths of existing mechanisms (e.g. robust price signals).

This CEPS Task Force has formulated three sets of objectives that reformed and new mechanisms should meet:

- environmental integrity (e.g. limiting pure-offsetting, additionality);
- enhanced investment (e.g. integration with national strategies, leverage of private investments) and
- institutional strength at the international level (e.g. integrity of mechanisms with the overall architecture, compatibility between mechanisms and coherence of the framework).

These three objectives are considered to be common to the four mechanism options introduced in this report (reform CDM, reform JI, sectoral crediting, sectoral trading), although their relevance varies across options. While there are other equally important objectives such as contributing to sustainable development, competitiveness and a level-playing field, they would not necessarily apply to all mechanisms or all sectors (e.g. the CDM aimed to contribute to sustainable development, whereas sectoral approaches attempt to soften competitiveness concerns as well as improve environmental integrity).

This chapter compares the four mechanism options examined in the previous chapter in light of the three objectives for reformed and new mechanisms.

4.1 Environmental integrity

The environmental integrity of the so-called 'project' (or 'baseline-and-credit') mechanisms, especially the CDM, rests on their assurance for additionality and limiting pure offsetting. One of the ongoing controversies relates to the current CDM as being largely offsetting, as section 2.1 mentioned. While ultimately environmental integrity is primarily a matter of the stringency of a country's commitment or an installation's cap in addition to the nature of a flexible mechanism, it would be important to reduce or eliminate perverse incentives to weaken the commitment or cap. In response, mechanism or design options rewarding ambitious and dynamic baseline levels (e.g. sectoral benchmarking in the CDM for the cement sector) would be a good starting point, including some measure of international average or best practice in environment.

Such options are offered by the reformed CDM and sectoral crediting. In the CDM reform, offset crediting could, in time, be limited to LDCs and additionality needs to be ensured. JI and sectoral trading are less problematic because in theory they incorporate direct and explicit links to AAUs, (i.e. the AAU/ERU link for JI and binding sectoral targets/binding domestic caps for the trading). However, this depends on the level of initial allocation of these units in light of environmental integrity.

4.2 Enhanced investment

Improvements in general investment conditions would help developing countries attract more private investments in low-carbon technology and abatement actions. A starting point would be the two priorities: removing barriers to investments and trade in low-carbon energy technologies and enhancing economic incentives.[22] For the former, priorities may include reducing risk and uncertainty, stabilising the legal or regulatory framework, developing necessary infrastructure, increasing the scope for a role by the private sector, respecting intellectual property rights, and providing access to financial resources, information, expertise and know-how. For the latter, key drivers may include the prospects for market development and expansion with profitability, some form of tax reduction,

[22] The expansion of investments and trade in cleaner energy technology is promoted by the Asia-Pacific Partnership for Clean Development and Climate (APP) (see http://www.asiapacificpartnership.org/).

exemption or other incentives to reduce investment costs, a longer commitment period beyond five years matching investment cycles, and the possibility to phase-in advanced technologies. Leveraging investment depends on i) improving the investment conditions, in particular improving the predictability of the processes and their time scales of operation and ii) making clear that there will be a rate of return for private sector capital. It is vital that confidence is not lost in the operation and future viability of the mechanisms, particularly in times of economic crisis where many 'safer' opportunities exist for investments.

It is crucial for governments to address the two priorities – removal of barriers to investments and trade as well as enhancing economic incentives – and articulate how to incorporate specific mechanism options for given purposes in its national strategy or action plan for a low-carbon economy. In this regard, all four mechanism options – reformed CDM, reformed JI, sectoral crediting and sectoral trading – would be compatible with and could be incorporated into host governments' national strategies or action plans. Sectoral crediting and sectoral trading depend on the host country's ability to implement intermediary, national schemes. In general cap-and-trade types of emissions trading (e.g. sectoral trading) could leverage a greater scale of financial flows or private investment than other baseline-and-credit type options (reformed CDM, reformed JI or sectoral crediting). In the latter there is an expectation that CDM will be scaled up on a programmatic or sectoral basis.

A particular issue that must be addressed for the future sectoral crediting or sectoral trading mechanisms is the role of private investment. Initial presentations of these mechanisms indicate substantial roles for host governments in introducing policies and measures to deliver the agreed commitments, as well as in dispersing the credits gained through emissions reductions. The means by which for a private investor to invest in a sector (rather than an individual project, as in the current CDM) and the ability to receive credits are, at present, unclear. Furthermore, investors may attach more risk to contractual arrangements with governments for the delivery of credits than they do to those entered into with private entities.

4.3 Institutional strength

The third and last objective focuses on the ability of a mechanism to function well on its own, to work together with other mechanisms and to fit in with any future architecture devised. First, to work better, simpler rules

and procedures should be adopted and complexity eschewed. Second, to work together, there should be an increase in coherence or compatibility between different mechanisms, old and new, and those running in parallel. Market linking issues, including ways to make new mechanisms work alongside existing mechanisms, are crucial in the development of the carbon market. Lastly, there should be more integrity between individual mechanisms and the overall architecture.

In addition, there is the element of timing, especially in transition between mechanisms: the evolution of existing mechanisms and the introduction of new ones, especially the end-dates for access to the mechanisms.

Policy-makers are expected to provide more clarity about the direction, pathways and duration of the transition, which would be key to maintaining and increasing private investments. One useful approach would be to set up a long-term domestic regulatory framework ideally backed by an international agreement that could be adapted to changes in circumstances. Such a long-term framework should be able to provide stakeholders with some clarity about access to market mechanisms and improve predictability about their investment conditions.

At the same time, it is important to provide rules on the treatment of double-counting, as it is likely that more than one mechanism will operate simultaneously. Reforms should be practical with a view to making existing mechanisms work better in rules and procedures. Reformed mechanisms should be ready to implement until new mechanisms are put in place. While reformed mechanisms are up and running, support for capacity-building aimed at new mechanisms must be provided as it takes a long time for new mechanisms to become operational, e.g. benchmarks must be set and agreement reached on where to set the benchmarks and how much flexibility is to be allowed. New mechanisms should be simple, functional, sound in cost-performance for participating companies (e.g. a company's cost of participation should not outweigh the expected benefits) and profitable for the investors.

One outstanding question concerns the circumstances and timing under which mechanism options could be introduced or phased out, for example, with a sun-set clause. A move to a more advanced mechanism can be achieved through a number of design options, for example, baseline-setting and eligibility criteria. There could be several paths built upon existing and new mechanisms, both fast track and otherwise, for moving forward. One suggestion (European Commission, 2009a and b; Burniaux et

al., 2009) would be to evolve sectoral crediting based on no-lose targets, gradually tightening the negotiated baselines and converting them into absolute caps for sectoral trading, and expanding them across sectors while strengthening the caps. A national low-carbon strategy would be the basis for receiving external finance to put the crediting scheme into practice. Another suggestion explores the possibility for converting the CDM into JI and inviting new Annex I countries and sectors to participate. Clarification of these paths could offer investors more predictability on which to base their investment decisions. However, any proposal first needs to reflect the explicit preferences, capacities, needs as well as different circumstances of developing countries at the early stage.

5. CONCLUDING REMARKS

This overview of existing and new mechanism options has pointed to common directions for future flexible mechanisms.

CDM and JI reforms give priority to enhancing efficiency of administration and transparency of governance. Predictability and consistency in decision-making will also facilitate the management of the entry of projects in the pipelines. Both expansion of the scope beyond project activities and the wider use of alternative, conservative and simpler approaches like benchmarks will also contribute to reducing delays in registration and issuance attributed to the additionality requirement.

Among others, sectoral crediting and sectoral trading could contribute to the development of the carbon market by addressing GHG emissions from key sectors in developing countries. However, each mechanism faces a number of challenges including the difficulty of taking into account that variance in industry structure and boundary conditions that exists across countries. Moreover, the involvement of private investors requires further exploration.

For higher environmental integrity, reformed CDM and sectoral crediting reward ambitious and dynamic baselines (e.g. sectoral benchmarking in the CDM for the cement sector, although the process for developing such baselines under sectoral crediting is still unclear). JI and sectoral trading incorporate direct and explicit links to AAUs, but the environmental integrity of such links depends on how the AAUs are initially allocated. Furthermore, monitoring, reporting and verification must be at least equivalent to that developed under the current JI/CDM regimes, as a tonne of emissions reduction will have an equivalent monetary value to the reduction of a tonne under JI/CDM.

To enhance investment, all the four options – reformed CDM, reformed JI, sectoral crediting and sectoral trading – could be incorporated

into a developing country's national strategy or action plan. Sectoral trading could leverage a greater scale of financial flows than the other three mechanisms.

Lastly, a comparison of the mechanism options in terms of their respective institutional strength was not conclusive, but the exercise did lead to indicative suggestions for further exploration. These included the development of sectoral crediting based on no-lose targets into an economy-wide cap-and-trade emissions trading scheme via sectoral trading, and the possibility to convert the CDM into JI.

In conclusion, these mechanism options could play different roles in a new climate change regime to reflect the different motivations identified at the beginning of this report: GHG emissions reductions, development of a carbon market, technology diffusion and financing. The future agenda may include a stronger focus on the potential contribution of flexible mechanisms to technology diffusion and an analysis of the interactions, including linking, between different mechanisms. In order to engage potential investors, however, it is vital that early clarification is received on the operation and scope of the reformed and new mechanisms as well as on the timetable for their operations and the transition between the different mechanisms. It is also essential that potential investors receive sufficient information to allow them to forecast future supply / demand balances.

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ANNEX 1. ACRONYMS AND TECHNICAL TERMS

AAU	Assigned Amount Unit (under Kyoto Protocol international emissions trading)
AIE	Accredited Independent Entity
APP	Asia-Pacific Partnership on Clean Development and Climate
BAU	Business as usual
CCAP	Center for Clean Air Policy (Washington-based think tank)
CCC	Climate Change Capital, London
CCS	Carbon capture and storage / sequestration
CDM	Clean Development Mechanism (a mechanism under Article 12 of the Kyoto Protocol)
CEPS	Centre for European Policy Studies
CER	Certified Emissions Reduction (under the CDM)
CH_4	Methane
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
COP	Conference of the Parties to the UNFCCC
CO_2	Carbon dioxide
CO_2e / CO_2eq	Carbon dioxide equivalent
CSI	Cement Sustainability Initiative (under the auspices of the World Business Council for Sustainable Development)
DEFRA	Department for Environment, Food and Rural Affairs, UK Government
DNA	Designated National Authority
DOE	Designated Operational Entity
DVM	Determination and Verification Manual
EB	Executive Board (of the CDM)
EBRD	European Bank for Reconstruction and Development

ECN	Energy research Center of the Netherlands
eq / e	Equivalent
ERU	Emissions Reduction Unit (under the JI)
ETS	Emissions Trading System / Scheme
EUA	EU Emissions Allowance
EU ETS / EU-ETS	EU Emissions Trading Scheme
GDP	Gross Domestic Product
GHG	Greenhouse Gas (the six gases covered by the Kyoto Protocol, CO_2, CH_4, N_2O, HFCs, PFCs and SF_6)
GIS	Green Investment Scheme
GNR	Getting the Numbers Right (a CSI initiative)
Gt	Gigatonne (billion metric tonnes)
HCFC-22	Difluorochloromethane = Chlorodifluoromethane (also known as Freon 22 and R-22)
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorcarbons
IDDRI	Institute for Sustainable Development and International Relations, Paris (Institut du développement durable et des relations internationals)
IET	International Emissions Trading
IEA	International Energy Agency
IETA	International Emissions Trading Association
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation (under Article 6 of the Kyoto Protocol)
JISC	Joint Implementation Supervisory Committee (of the UN)
KP	Kyoto Protocol
LDCs	Least Developed Countries
LULUCF	Land Use, Land Use Change and Forestry
MRV	Measurement, Reporting and Verification
Mt	Megatonne (million metric tonnes)
N_2O	Nitrous Oxide
NAMA	Nationally Appropriate Mitigation Action

OECD	Organisation for Economic Cooperation and Development
PoA	Programme of Activities
PBL	Netherlands Environmental Assessment Agency
PDD	Project Design Document
PFCs	Perfluorocarbons
REDD	Reducing deforestation and forest degradation in developing countries
RIT	Registration and Issuance Team
SB-30	Thirtieth session of the UNFCCC subsidiary bodies
SD-PAMs	Sustainable Development Policies and Measures
SF_6	Sulfur Hexafluoride
SIDS	Small Island Developing States
tCO_2e / tCO_2eq	Metric tonnes of carbon dioxide equivalent
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WBCSD	World Business Council for Sustainable Development
ZEW	Centre for European Economic Research, Mannheim (Zentrum für Europäische Wirtschaftsforschungen)

ANNEX 2. MEMBERS OF THE TASK FORCE AND INVITED GUESTS AND SPEAKERS

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