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# **MATCHING MITIGATION ACTIONS WITH SUPPORT: KEY ISSUES FOR CHANNELLING INTERNATIONAL PUBLIC FINANCE**

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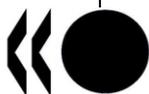
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Joy Aeree Kim, Jane Ellis (OECD) and Sara Moarif (IEA)

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## FOREWORD

This document was prepared by the OECD and IEA Secretariats in Autumn 2009 in response to the Annex I Expert Group on the United Nations Framework Convention on Climate Change (UNFCCC). The Annex I Expert Group oversees development of analytical papers for the purpose of providing useful and timely input to the climate change negotiations. These papers may also be useful to national policy-makers and other decision-makers. In a collaborative effort, authors work with the Annex I Expert Group to develop these papers. However, the papers do not necessarily represent the views of the OECD or the IEA, nor are they intended to prejudge the views of countries participating in the Annex I Expert Group. Rather, they are Secretariat information papers intended to inform Member countries, as well as the UNFCCC audience.

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## Executive Summary

At the heart of designing a successful framework for the post-2012 climate change regime are the issues of finance and enhanced greenhouse gas (GHG) mitigation – both in developed and developing countries. How to “match” support with GHG mitigation actions in developing countries will play a crucial role in addressing both issues of finance and enhanced mitigation, as it can affect the environmental performance and cost-effectiveness of such support. Matching is defined as a process of directing support (in particular from international public sources) from developed countries to implement mitigation actions in developing countries that require assistance. The challenge of “matching” is how to channel multiple sources of international public finance in a strategic way to mitigation actions in developing countries, so that matching could lead to mainstreaming of mitigation actions into domestic policy frameworks without derailing developing countries from their development paths. If done effectively, it could also contribute to greater leveraging of private sector investment.

This paper explores experience with, and possible design elements/options for, a mechanism to match support<sup>1</sup> with nationally appropriate mitigation actions in developing countries that require such support. Supported mitigation actions will form only a part of developing country GHG mitigation actions post-2012. In order for GHG mitigation actions to be most effective, it will be important to determine how unilateral, supported and credited mitigation actions fit within the overall national climate policy framework, and ensure that different potential sources of finance (domestic and international, public and private) do not “compete” for the same mitigation actions. For instance, a matching mechanism could support actions that are unlikely to be financed by the carbon market (*e.g.* due to their high-transaction cost or low volume GHG reductions).

Several factors can help to ensure an effective matching of support with mitigation actions. These include increased information about which actions need support, and to what extent; as well as increased co-ordination – particularly between donors and recipient countries. Indeed, this latter point has been explicitly mentioned in the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action (2008). Such co-ordination would ensure greater ownership by recipient countries of supported mitigation actions, and would also facilitate more effective disbursement of international public financing. In particular, it could be useful to identify and agree a core or minimum set of eligibility criteria for supported mitigation actions, and potentially also prioritisation criteria – although these may not be straightforward to agree upon.

Many multilateral funds examined in this paper have set up eligibility and prioritisation criteria, which vary depending on the specific aims or objectives of different funds. These examples illustrate many different possible eligibility criteria as well as many ways of prioritising support for eligible mitigation actions. For instance, eligibility criteria could include recipient countries’ level of development and/or the existence of a Low-Carbon or Low-Emission Development Strategy (hereafter, LEDS). They could also include criteria such as readiness and implementation capacity of recipient countries (*e.g.* institutional capacity to undertake proposed projects, confidence in the country’s legal system, willingness to monitor and ability to report and measure).

Once eligibility criteria for mitigation actions are agreed, a means to prioritise access to public finance may be needed. Several different prioritisation criteria are possible, *e.g.* the recipient country’s mitigation potential or level of development, sectors with cost-effective mitigation potential, or mitigation actions’ ability to leverage private investment. Cost-effectiveness of GHG mitigation for instance, may be an important factor when prioritising mitigation actions for international public support because it will allow more GHG reductions for a given amount of funding. Co-ordination between different funds on how to disburse support would allow disbursement to fulfil strategic goals, such as geographical or sectoral balance.

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<sup>1</sup> While the Bali Action Plan refers to ‘support’ in the context of finance, technology transfer and capacity building, ‘support’ in this paper largely focuses on finance.

The institutional set-up for matching is important as it determines who makes or influences decisions on support: how such decisions are made; how the efficiency of support provision is assessed; and the timing of both decisions and financial flows. There are different ways in which support provision and support requests could be “matched”. These include an “institutionally light” process, whereby existing individual funds pick and choose their priorities for support from an international registry (or other recording/reporting mechanisms) of mitigation actions. At the other end of the spectrum, a centralised clearinghouse or a matching mechanism could also be envisaged. Indeed, this has been suggested by some countries, such as Saudi Arabia, in the on-going UNFCCC negotiations. “Matching” finance and requests via a clearinghouse has been done in other areas (*e.g.* “technical review panel” of the Global Fund and “Lifeweb” clearinghouse for protected area financing under the Convention on Biological Diversity). These examples suggest that any clearinghouse operation on climate change, which might be at larger scales of funding, would require significant institutional capacity.

There are strengths and weaknesses associated with both centralised and decentralised approaches to matching support with actions. A decentralised approach, while allowing each fund to focus on their priority sectors/areas, would not necessarily lead to a balanced disbursement of support, in terms of the types of mitigation actions, coverage or treatment of countries or sectors. A decentralised approach might also be less effective in simplifying access to financing. By contrast, a more centralised approach would increase consistency (and potentially also transparency), but could impose significant administrative burdens.

A “middle ground” may be to develop some sort of co-ordinating mechanism that can help different funds and/or recipient countries match requests with support. Increased co-ordination amongst funds could increase coherence between them, for example in agreeing minimum eligibility criteria for finance (*e.g.* the existence of a LEDS or similar plan), while still allowing funds some flexibility to support different types of mitigation actions in different locations and sectors, depending on the fund’s eligibility criteria and priorities. Increased co-ordination on both recipient and donor country sides could also enhance consistency, thereby contributing to more effective and predictable matching. Increased co-ordination of donors (*e.g.* on organisational, operational, programme management) reduces transaction costs both for donors and recipients and enhances efficiency. Increased co-ordination within the recipient country governments could help ensure that support is directed towards country-driven priorities.

There remain many pending issues which would influence disbursement strategies and institutional options for a matching mechanism. For instance, how to design the post-2012 financial architecture is important as it will impact the total amount of finance channelled via the UNFCCC framework. It will also affect the institutions needed to govern the funds, and the need for international guidance, *e.g.* on eligibility or prioritisation. The key issues for designing an effective and efficient matching mechanism outlined in this paper therefore need to be taken into consideration in the broader context of the financial architecture of the post-2012 climate framework.

## 1. Introduction

At the heart of designing a successful framework for the post-2012 climate change regime are the issues of finance and greenhouse gas (GHG) mitigation. In particular, decisions on how to match increased support with more ambitious GHG mitigation actions by developing countries will be critical. Paragraph 1 (b) (ii) of the Bali Action Plan calls for:

*“Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner.”*

Several studies have analysed the levels of investment needed for ambitious GHG mitigation actions by developing countries. The 2007 UNFCCC report for instance estimated that additional investment needed to reduce carbon dioxide equivalent (CO<sub>2</sub> eq) emissions by 25% below 2000 levels in 2030 would amount to USD 200-210 billion annually (UNFCCC, 2009c),<sup>2</sup> of which USD 130 billion will be needed in developing countries.<sup>3</sup>

According to Corfee-Morlot *et al.* (2009), current support from developed countries for mitigation actions in developing countries, *e.g.* via bilateral official development assistance (ODA), multilateral aid, global funds, and the clean development mechanism (CDM) is estimated between USD 8-53 billion for 2007. Of this, about USD 8-10 billion are in the form of international public support.<sup>4</sup> This highlights that:

- Current levels of support will need to be significantly increased in order for a post-2012 climate framework to deliver on ambitious GHG goals;
- Leveraging private-sector investment is crucial to provide the necessary support, as public resources will be limited;
- Demand for support may be significantly greater than supply

The post-2012 climate framework will therefore need to include provisions for scaled-up public support and better delivery of that support, as well as provisions for matching financial support with proposed GHG mitigation actions.<sup>5</sup> The challenge of “matching” is finding a way to connect multiple sources of finance in a strategic way to mitigation actions facing financing gaps in developing countries. If done effectively, this could also lead to the mainstreaming of mitigation actions into domestic policy frameworks, as well as greater leveraging of private sector investment.

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<sup>2</sup> Under the “mitigation scenario” presented in the 2007 report, 25 per cent below the 2000 emissions of 38.9 Gt CO<sub>2</sub> eq corresponds to global emissions reductions in 2030 reduced from 61.5 Gt CO<sub>2</sub> eq under a “reference scenario” to 29.1 Gt CO<sub>2</sub> eq (UNFCCC, 2009c).

<sup>3</sup> According to the European Commission Communication, the net global incremental costs in 2020 would amount to EUR 175 billion, of which more than half will be needed in developing countries, including for the forestry sector (EC, 2009a; EC, 2009b). Project Catalyst estimated that an incremental capital expenditure of EUR 210 billion on average per annum between 2010 and 2030 would be required to tap GHG mitigation opportunities in developing countries, and that average annual upfront capital expenditure of EUR 280 billion would be required additionally in developing countries (Edwards, 2009). It should be noted that these figures are aggregates and do not distinguish public vs. private sources.

<sup>4</sup> The variation depends on different factors, including *i.e.* how CDM is accounted for. These estimates are for 2007 only. See Annex I for details.

<sup>5</sup> This paper does not discuss how to generate financial resources. See Brown, J. (2009) on ‘New and Innovative Funding for Climate Change’, IEA World Energy Outlook (2009).

There are also different aims with which support for mitigation actions may be provided. For example, some support may focus on mitigation actions that have a direct impact on GHG emissions (*e.g.* increased deployment of energy efficiency and renewable energies). In contrast, other support may be directed at different parts of the “lifecycle” of mitigation actions in developing countries which do not have a direct impact on GHG emissions. Examples of such climate-relevant activities highlighted in the recent negotiation “non-papers” (UNFCCC 2009e) include preparing national emission inventories and national communications; technology needs assessments and undertaking measurement, reporting and verification of nationally appropriate mitigation actions in developing countries. However, this paper focuses on matching financial support with mitigation actions.<sup>6</sup>

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### Box 1: Definitions and terminology

The definitions of terminology used in this paper are yet to be agreed by the international climate community. This paper therefore uses the following definitions.

**Mitigation actions.** The term “mitigation actions” is used in this paper to encompass GHG mitigation actions in developing and developed countries. These include actions targeting GHG mitigation directly (climate-specific) as well as actions that are climate-relevant, such as policy reforms. Mitigation actions may occur at different scales, *i.e.* project level, sector level, programmatic, national or sub-national level. Mitigation actions can also take various forms such as regulatory or fiscal measures, institutional reforms or R&D support.

Mitigation actions can be classified into three categories<sup>7</sup>.

- **Unilateral:** Actions financed and implemented domestically without any external support. (Implemented and/or pledged).
- **Supported:** Those that require (or have benefitted from) assistance, in the form of finance (*e.g.* loans or grants), capacity building and/or technology in order to be implemented (This paper does not make any judgement as to how such support is provided). The term could also refer to mitigation actions that have benefitted from finance (*e.g.* loans or grants), capacity building and/or technology.
- **Credited:** Mitigation actions that are undertaken to generate credits which can then subsequently be sold on the carbon market. While this could also be seen as a form of “support”, it is useful to separate this category of mitigation actions as there are several already-existing requirements relating to how to measure, report and verify emission reductions from market-based mechanisms.

**Registry.** This term is used to signify a possible location/format in which information on mitigation actions (and potentially other information, *e.g.* on the nature and level of support provided by developed

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<sup>6</sup> In providing support, priority could be given to certain types of support needs for mitigation actions, although in practice, it is often difficult to distinguish different types of support (*e.g.* capacity building, technology transfer and finance). The EU in its communication on ‘stepping up international climate finance: a European blueprint for the Copenhagen deal’, for instance, proposed that a fast-track financing be channelled to adaptation and capacity building in developing countries (EC, 2009c). Some Parties are proposing that different types of financing needs for REDD activities could be financed by different types of support and mechanisms via a “phased approach”. Generally, 3 phases are proposed: (i) Voluntary funding for capacity building; (ii) a binding finance instrument for policies and measures; and (iii) markets for quantified emission reductions (Meridian Institute, 2009).

<sup>7</sup> These categories can overlap in practice, making it difficult to clearly identify a mitigation action as unilateral, supported or credited. Further, as there is yet no agreement on what a “nationally appropriate mitigation action” constitutes for developing countries, with some countries indicating that these are only actions that benefit from international support, and other countries indicating that they include unilateral and credited actions (see UNFCCC, 2009e for more details).

countries) is recorded. It will be this information that is measured, reported and verified in accordance with the Bali Action Plan.<sup>8</sup>

**Mitigation support.** Mitigation support is defined as international efforts that would trigger, or directly provide, financing, capacity building and technology support for mitigation actions in developing countries. Although mitigation support includes public support (*e.g.* dedicated funds or ODA) and may as well include private support (*e.g.* carbon market), this paper focuses only on international support from public sources (also referred to as “international public support”). Support could be reported in financial or other terms (*e.g.* credits generated/received, training courses provided etc.). Support can be North-South, *i.e.* with finance flowing from developed to developing countries, or South-South, *i.e.* with finance flowing from one developing country to another.

**Matching.** Matching is defined as a process of directing support from developed countries to implement mitigation actions in developing countries that require assistance due to their costs. Once mitigation actions and their support needs are identified, and this information is submitted to a reporting/recording mechanism, matching involves international assessment of support requests and prioritisation of support, so that support could be disbursed.

**Eligibility criteria.** Eligibility criteria are a set of minimum requirements that mitigation actions should meet in order to receive support. These criteria help funds strategically target available resources to mitigation actions that are likely to achieve the intended outcome in a more effective and efficient way. Eligibility criteria may vary depending on different channels of support (*e.g.* multilateral or bilateral), focus, administrative organisations and desired outcomes of funds.

**Prioritisation.** Prioritisation is defined as a particular orientation of funds or preference of donors and/or recipients for certain technologies, sectors, types of actions, groups of recipient countries or regions that they wish to provide support. Sometimes, eligibility criteria are defined based on such prioritisation. For instance, the GEF Trust Fund prioritises mitigation projects in the area of renewable energy, energy efficiency and sustainable transport. Some funds prioritise projects with strong poverty alleviation benefits or projects with private sector partnerships.

Source: Authors

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The aim of this paper is to examine key design elements for an effective and efficient matching mechanism that would support enhanced mitigation actions by developing countries. The paper is structured as follows: Section 2 sketches out how supported actions fit within a post-2012 framework and how the matching process could take place; Section 3 and 4 explore a number of eligibility and prioritisation criteria to be considered for strategic allocation of resources; Section 5 discusses how prioritisation criteria might be used to “score” mitigation actions; and Section 6 outlines institutional options for matching mitigation actions with support. Section 7 concludes by highlighting important issues for the design of an effective and efficient matching mechanism in the post-2012 agreement.

## 2. “Matching” in the post-2012 climate context

In order to ensure that global mitigation efforts are maximised, it will be important to assess where any mechanism to match support with GHG mitigation actions fits in the post-2012 climate framework. Designing a matching mechanism will have institutional and governance-related implications. Given that the post-2012 financial architecture will affect the institutions needed to govern the funds and the need for international guidance, a matching mechanism needs to be envisaged in the overall context of such a financial architecture.

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<sup>8</sup> This paper assumes that mitigation actions whose GHG emission reductions are difficult to quantify could still be included in a registry for recognition purposes, but that their emission impacts would be classified in other terms, *e.g.* in installed renewable capacity, hectares of reforested land, or “NE” (not estimated). For further discussion and examples see Ellis and Moarif, 2009.

## 2.1 What is the role of a matching mechanism?

Decisions regarding what kinds of support could be connected with which mitigation actions may be needed in a future matching mechanism. Currently, various sources of public funds support a wide range of mitigation actions. In addition, mitigation actions are supported by private sector finance (*e.g.* foreign direct investment for development and deployment of renewable energy technology) as well as the carbon market (credited mitigation actions). Criteria for the provision of public support can vary but can also overlap. For example, carbon market finance is largely driven by the search for least cost options and principles of cost-effectiveness are also explicitly considered by many funds that support mitigation actions, such as the Global Environment Facility (GEF).

Support via a matching mechanism would be most efficient if it supplemented – but did not replace – any funding or action initiated by the country’s own government, and if it targeted mitigation actions that are not likely to be financed by the carbon market<sup>9</sup> or otherwise through normal private investment channels. In this regard, some countries have suggested that support should target those mitigation actions with low to medium GHG marginal abatement costs (or those just beyond what would otherwise be supported through the carbon market).

In practice, however, minimising the overlap between supported actions, and those that are unilateral or credited would not be straightforward to achieve – unless Parties decided to explicitly exclude certain activities from market mechanisms, in which case such activities could be “eligible” for international public support. This is illustrated by the current carbon market where the Clean Development Mechanism (CDM) tends to focus on investments with low incremental cost (per tonne of CO<sub>2eq</sub> abated) and often high-volume emission reduction opportunities. If credit-based market mechanisms continue to operate post-2012, they are likely to continue to seek out such low-cost mitigation options. This is the unique advantage of a market mechanism; but it could mean that sources of finance or technology provided through public sources of support (international or domestic) to implement mitigation actions could be competing with the international carbon market for “good” projects.

This situation could be eased in different ways. For example, support for mitigation actions could be directed towards areas where the CDM has not been active. This could include sectors where technology has demonstrated potential, but has not yet been fully commercialised – such as the high-cost (but also high-mitigation potential) area of carbon capture and storage from power generation. It could also include sectors where there are market barriers to implementing mitigation projects, such as energy efficiency demand-side management. Indeed, some multilateral support is already directed towards this area (DEFRA, 2006). It could also include focusing support on sectors that are not eligible to generate credits via the carbon market (*e.g.* nuclear power, avoiding deforestation – if these are not eligible to generate credits in the post-2012 regime).

However, countries may resist targeting international public support to mitigation actions with higher incremental costs, or to politically “contentious” mitigation options. Care would also be needed if international support focused on options where there is a net negative cost to the implementing country (*e.g.* energy efficiency measures). Indeed, certain developing countries have expressed concerns that much of the low-hanging fruit in terms of mitigation options have already been “picked” by the carbon market. Furthermore, some suggest that these actions might be prioritised for unilateral (*i.e.* unsupported) action. Nevertheless, support in the form of loans (rather than grants) could be still useful in overcoming market barriers, *e.g.* for mitigation actions with particularly high implementation of first costs (but potentially negative net costs in the long-term), as these are not necessarily going to be addressed by the carbon market. For high-cost actions, these could potentially be supported through other channels, for example, if they incorporate technology RD&D then possibly through public research budgets.

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<sup>9</sup> This paper presents a simplified picture of how actions can be categorised: in practice there may be overlap between various categories of actions; as they can be supported through public funds (both domestic and international) while benefiting from carbon credits.

Given the lack of agreement on what constitutes a nationally appropriate mitigation action, a matching mechanism could direct support towards actions that face funding gaps, rather than trying to identify up front which kinds of actions it will target. Some of these actions might have a higher degree of private sector involvement (*e.g.* infrastructure investment), in which case a matching mechanism would need to consider how to combine public and private sources of funding.

Fundamentally, a matching mechanism would need to direct support to mitigation actions for which that developing countries need support. A useful first step in targeting international support would therefore be for potential recipient countries to highlight where such actions fit in their national context. This could be done in a variety of ways, for example, if potential recipients produce a national low-emission development plan or outline the range of ‘nationally appropriate mitigation actions (NAMAs)’ that they are undertaking (or plan to undertake). At a minimum it would require potential recipient countries to indicate which of their proposed actions they request support for, and what form this support should take. As such, a means of reporting these actions internationally<sup>10</sup> remains the first step in developing a matching mechanism.

## 2.2 How would the matching mechanism work?

Any mechanism to match support and mitigation actions is likely to need to: (i) identify and evaluate support needs, (ii) prioritise support, and (iii) disburse/allocate support. These steps can only be undertaken once mitigation actions requiring support have been identified (*e.g.* via the host country submitting appropriate information internationally *e.g.*, to a registry of mitigation actions). A mechanism to match support and actions would have institutional requirements<sup>11</sup>. These implications could be larger or smaller depending on how a matching mechanism is set up, on the definitions (yet to be agreed) for both what is meant by “nationally appropriate mitigation actions” in developing countries and support; on the availability of information about mitigation actions needing support (which is in turn related to the issue of a mitigation actions registry or other mechanism), as well as on the structure of funds or other mechanisms to channel support. The institutional set-up (*i.e.* governance) of channelling support to mitigation actions is important, as it determines:

- Who makes or influences decisions on support (*i.e.* donors and/or host countries and/or experts);
- How decisions are made (*e.g.* based on criteria for eligibility and prioritisation);
- How the efficiency of support provided is assessed;
- Timing (of decisions and of funding).

The process of matching would involve actions and institutions at the national (developed and developing countries) as well as international level (Figure 1). As a first step, support from developed countries could be directed towards multilateral funds or via bilateral funding channels. Simultaneously, developing countries could identify mitigation actions that would need support in order to be implemented, and submit information on these – *i.e.* the action itself as well as the support needs – to a reporting/recording mechanism (or a matching mechanism). The institution(s) that are involved in running the registry or matching mechanism may need to get back to the potential recipient and/or to donors (*e.g.* to clarify information and/or to request details on which actions they would prioritise).

The next step would be to prioritise support. This could be done in two sub-steps: 1) who and what activities are eligible for support (eligibility criteria); 2) which countries or activities need to be

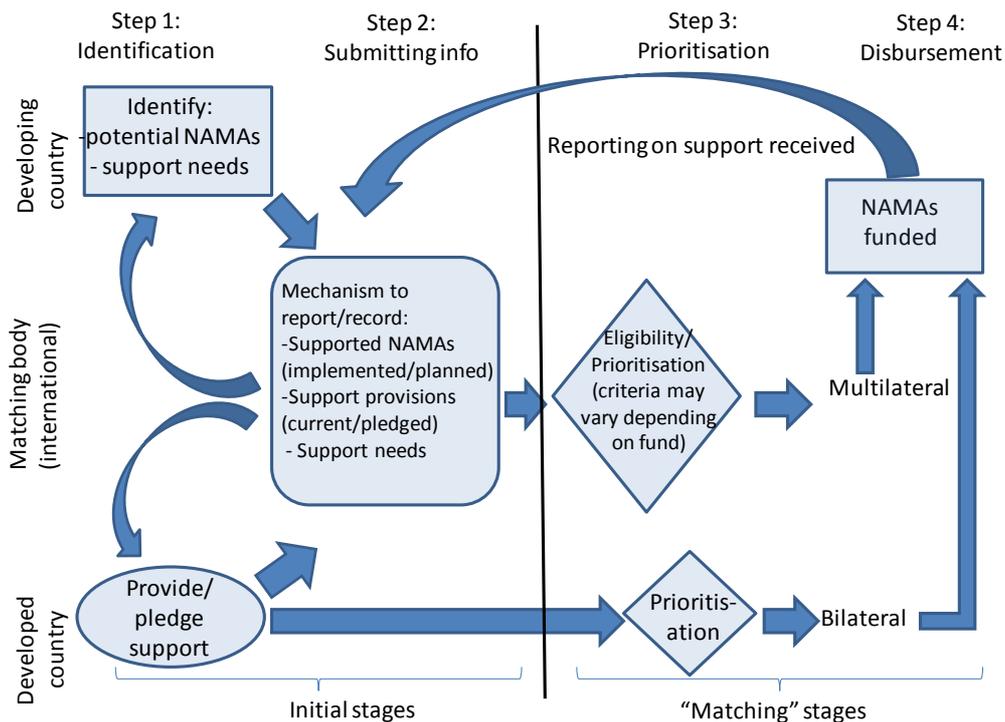
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<sup>10</sup> Discussion of the purpose and coverage of a potential reporting/recording mechanism for mitigation actions (as well as support and commitments) is included in an accompanying paper (Ellis *et al.* 2009).

<sup>11</sup> Institutional issues are discussed further in section 5.

prioritised (prioritisation criteria). For example, funds may want to direct their support towards countries that could demonstrate their readiness for mitigation actions or those with a certain level of income – and so would use this as a first “screen” to assess which mitigation actions or host countries to support. A second screen could be to prioritise amongst those mitigation actions which are eligible. For instance, funds may wish to prioritise cost-effective mitigation actions, or to prioritise those based on other criteria, such as replicability of actions. Such prioritisation criteria could be used to score or rank mitigation actions for support disbursement. Both eligibility and prioritisation screening could be done either at an international level (for multilateral funding) or at a national/bilateral level (if support is channelled via a bilateral fund).

Figure 1: Steps of a matching process



Source: Authors

Based on an analysis of existing funds, the following sections focus on key issues on matching mitigation actions with support, namely, eligibility criteria, prioritisation criteria, allocation of resources based on prioritisation criteria and institutional options for matching mitigation actions with support.<sup>12</sup> It should be borne in mind that at times the distinction between eligibility and prioritisation criteria is unclear and often, eligibility criteria of some funds are established based on the aims and purposes of funds. The Programme for Scaling-up Renewable Energy in Low Income Countries (PPCR), which only targets low-income countries, is a case in point.

### 3. Eligibility Criteria

Given that international public finance available to support post-2012 GHG mitigation actions in developing countries may fall short of the need for such support, decisions on how to direct such support are key. Such decisions can be classified in terms of *what* is eligible to be supported (section 3), as well

<sup>12</sup> It should be noted that countries diverge on the issues of eligibility criteria, allocation and who determines prioritisation criteria.

as on *how* to prioritise available support (section 4). (The issue of *who* makes operational decisions is treated in section 5).

A key feature of an environmentally and cost-effective finance mechanism is to establish eligibility criteria for participation (see Karousakis and Corfee-Morlot, 2007; Kim *et al.*, 2009). This may involve setting criteria for support distribution both to and within regions, as well as to sectors or activities that may be eligible for support.<sup>13</sup> Establishing such criteria agreed between recipients and donors would help to build trust that support is being directed to priority areas for the recipient country, and could also help to ensure that such priority areas are part of a coherent vision of both donor and recipient countries' a lower-GHG future. Several eligibility criteria could be considered to allocate support.

There are already many multilateral and bilateral funds dedicated to climate change (see Annex II). Most of these funds are managed by "operational guidance" on: what sort of activity or recipient is eligible for funding; what the priorities for countries or projects are; and what the decision-making structure for fund disbursements is.<sup>14</sup> Different funds are likely to continue to have different priorities post-2012. This means that there may continue to be more than one agreed set of both "eligibility" and "prioritisation" criteria.

Currently, eligibility criteria tend to vary depending on the administrative organisation, objective(s) and priority areas of individual funds. For instance, for multilateral funds, the goals of fund and the administering bank (*i.e.* the Multilateral Development Bank (MDB)) will help to define the overall direction of eligibility criteria. For example, most funds administered by the World Bank such as the Clean Technology Fund (CTF), the Pilot Programme for Climate Resilience (PPCR), the Programme for Scaling-up Renewable Energy in Low Income countries (SREP), and the Forest Investment Programme (FIP)<sup>15</sup> require that recipient countries be actively engaged in decision-making, including the definition of goals (see also discussion in section 6). Where the MDB has a lending programme they also have an on-going policy dialogue with the recipient country. The UN-REDD Programme, a multi-donor trust fund also requires that recipient countries have 'existing collaboration with UN partners in related areas' (UN-REDD Programme, 2008). A core set of eligibility criteria which could facilitate a strategic disbursement of support across multiple funds however, could be envisaged. For instance, at the 7th AWG-LCA meeting, the following eligibility criteria were proposed as part of principles for an effective financial mechanism: national and regional development priorities; natural and geographical characteristics; resource endowment; relative size of the economy; economic and technical capacity; position on the human development index; and being eligible to borrow from the World Bank (IBRD and/or IDA) or to be an eligible recipient of UNDP technical assistance through its country Indicative Planning Figure (IPF) (UNFCCC, 2009f). Any matching mechanism could be based on such a core set of eligibility criteria. Based on a review of existing funds, this section discusses two possible eligibility criteria that could be relevant for matching support with actions, namely development levels and readiness and implementation capacity of recipient countries.<sup>16</sup>

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<sup>13</sup> The issue of eligibility criteria remained contentious at the 7<sup>th</sup> AWG-LCA meeting. For instance, some countries propose that all developing country Parties should be eligible to access financial resources, with special attention given to the adaptation needs of the most vulnerable countries, while others propose that all Parties that meet specified criteria be eligible to access the financial resources (UNFCCC, 2009f).

<sup>14</sup> Information on disbursement is not readily available for most (multilateral) funds examined in this paper, largely because most funds administered by the World Bank are still at their early stage and yet to be disbursed.

<sup>15</sup> See Annex III for the areas of focus and administrative organisations of the multilateral and bilateral funds being discussed in this section.

<sup>16</sup> The source of information on multilateral funds discussed in this section is largely borrowed from the climate funds updates available at: <http://www.climatefundsupdate.org/resources>. See Annex III for a summary of eligibility and prioritisation criteria of existing funds examined in this paper.

### 3.1 Recipient countries' level of development

In determining who is eligible for support, recipient countries' level of development could be used to set a threshold as these factors could help to indicate which countries are least able to provide domestic support for GHG-related action themselves. Several indicators could be used to determine recipient countries' level of development e.g. human development index, GDP per capita, eligibility for ODA)<sup>17</sup> (see also Karousakis et al. 2008). Most funds administered by the World Bank such as the CTF, PPCR, SREP, and the FIP require ODA eligibility for recipient countries based on OECD/DAC guidelines (World Bank, 2008a; World Bank, 2008b).

According to the ODA eligibility criteria, recipient countries are categorised in four groups based on their income level: 1) least developed countries; 2) other low income countries (per capita GNI<USD935 in 2007); 3) lower middle income countries and territories (per capita GNI USD936-USD3705 in 2007); and 4) upper middle income countries and territories (per capita GNI USD3706-USD11 455 in 2007) (OECD, 2009a).

Any of these four income categories or different thresholds set by other indicators of level of development (e.g. human development index or GDP per capita) could be used as an eligibility criterion, depending on the objective of the fund. Alternatively, these grouping could be used for further prioritisation in disbursement, once eligibility has been determined.<sup>18</sup>

### 3.2 Readiness and implementation capacity of recipient countries

The readiness and implementation capacity of recipient countries (e.g. enabling policy framework, institutional capacity to undertake proposed projects and confidence in the country's legal system) is a crucial determinant of successful implementation of proposed mitigation actions. Thus, such information could also be used to assess eligibility. Several funds such as the SREP, CTF and the PPCF look at the implementation capacity or the potential of recipient countries such as whether or not they have a "business-friendly" environment (e.g. to have a policy framework that is conducive to investment). The Forest Carbon Partnership Facility (FCPF) also takes account of the level of recipient country readiness as one criterion for eligibility.

The readiness and implementation capacity of recipient countries can be broken down into three sub-criteria: conducive policy environment; performance with fulfilling UNFCCC requirements; and enabling activities for mitigation actions. These are examined below.

#### 3.2.1 Conducive policy environment

A policy environment in developing countries that is generally conducive to effective use of support is needed in order for such countries to be able to effectively process any support received for GHG mitigation actions. There are several different aspects of such a policy environment. These include issues not directly related to climate change (e.g. good governance) as well as issues directly related to climate change (explored in the sub-sections below).

Indices that attempt to measure and track "good governance" related issues, however, are contentious and have been criticised for their lack of transparency. This is one of the reasons behind the GEF restructuring its resource allocation framework (RAF) to move away from reliance on the World Bank's Country Policy and Institutional Assessments (CPIA), which assess countries against good governance-type criteria. The GEF is decreasing the weight of indicators based on CPIA, and increasing that of indicators based on GEF programme implementation and outcomes (GEF, 2009b; see Box 2). Other

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<sup>17</sup> Eligibility for ODA is based on Gross National Income (GNI).

<sup>18</sup> It is difficult at times to draw the line between what are "eligibility" criteria, and what are "prioritisation" criteria. Some funds could combine the two. However, this paper discusses each separately.

funds such as the CTF, FIP, UN REDD programme and MDG Achievement Fund also request the existence of concrete planning processes as a means of determining the likelihood of successful implementation.

A detailed assessment of what constitutes a conducive policy environment is beyond the scope of this paper. However, the “readiness” of countries to receive and to efficiently process support provided for GHG mitigation actions could be based on several factors. These could include levels of efficiency and corruption in the recipient country public administration; an independent and well-functioning legal system; and macroeconomic stability (Jacobs and Coolidge, 2006; Ellis and Kamel, 2007; Corfee-Morlot et al., 2009). Many different organisations work on aspects relevant to these issues, including Transparency International (which publishes an annual survey of “Corruption Perceptions Index”<sup>19</sup>) and Euromoney (which publishes an annual survey of Country Risk rankings<sup>20</sup>).

### **3.2.2 Degree of fulfilment in meeting UNFCCC requirements**

One way of assessing recipient country readiness and implementation capacity for GHG mitigation actions (particularly if these funds are being channelled via the UNFCCC) would be to assess their degree of fulfilment in meeting current GHG-related obligations under the UNFCCC. These focus on – contingent on provision of support to undertake these activities – monitoring and reporting, namely, the development of GHG inventories and national communications.

A large majority of non-Annex I countries fulfil these requirements. For example, at least 130 non-Annex I countries have submitted one National Communication (which includes information on GHG inventories), and more than 120 are working on their Second National Communication (UNFCCC 2009g).

### **3.2.3 Enabling activities for mitigation actions**

A conducive policy environment, as well as adequate monitoring and reporting of GHG emission levels and actions, can help identify GHG mitigation actions and facilitate their implementation. Other activities can also help ensure that any implemented mitigation actions are effective, and so could also be envisaged as potential future eligibility criteria. These include:

- Integrating GHG mitigation actions into a national development plan (e.g. via a low-emission development strategy, LEDS);
- Increasing information availability on the mitigation action, e.g. via monitoring its costs and/or the effects of its implementation, and reporting these results internationally.

A LEDS<sup>21</sup> can help facilitate efficient use of by integrating climate change concerns into national policy and indicating where the supported action fits within this strategy.<sup>22</sup> A number of country submissions in the UNFCCC process are increasingly pointing towards the utility of a LEDS (UNFCCC 2009b).<sup>23</sup>

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<sup>19</sup> See [http://www.transparency.org/policy\\_research/surveys\\_indices/cpi](http://www.transparency.org/policy_research/surveys_indices/cpi) for more details.

<sup>20</sup> See <http://www.euromoney.com/Poll/10683/PollsAndAwards/Country-Risk.html> for more details. Corfee-Morlot et al. (2009) also discuss the notion of domestic enabling environment and policy frameworks for investment more generally as a determinant of private investment flows in any national context; this draws on a long-standing literature in the investment policy area.

<sup>21</sup> In the recent EU communication, the EU calls for the low carbon growth plans (EU 2009c).

<sup>22</sup> According to the AWG-LCA non-paper #51, it was proposed that ‘a low-emission [high growth sustainable] development strategy’ contain a description of all nationally appropriate mitigation actions that the Party has implemented or is planning to implement (UNFCCC, 2009e).

The existence of overarching strategies or a national plan, such as a LEDS, could therefore become an eligibility criterion for countries to receive support for post-2012 GHG mitigation. (If this were to be the case, the development of LEDS may also need to be funded internationally). Depending on the specific goals of funds, the required strategies or plans may vary, but the existence of a LEDS could help to ensure that the proposed mitigation actions remain consistent in terms of achieving their intended outcomes without undermining each other at the national level. In the context of the post-2012 climate negotiations, LEDS could be an opportunity for each developing country to indicate its willingness to undertake GHG mitigation actions, as well as how it intends to reconcile emission mitigation actions with its national development strategies or broader sustainable development strategies (and its priorities, including poverty eradication) (UNFCCC, 2009b).<sup>24</sup>

In the longer term, demonstrating unilateral actions together with mitigation potential of national strategies or plans over the medium and long-term and their consistency with global emission goals could facilitate achieving more ambitious GHG mitigation actions in developing countries. In this context, some sort of international recognition for unilateral GHG mitigation actions could be helpful (see Ellis et al 2009 for a discussion of these issues).

Increased measurement, reporting and verification (MRV) of GHG mitigation actions and support can also help to provide an enabling environment for such actions. For example, monitoring, evaluation and reporting of current policies, and progress towards stated policy goals, are often carried out in both developed and developing countries. Such mid-term evaluations are a useful tool to provide national policymakers with information on the success, or need for modifications, to a particular policy. If such MRV activities were more systematic, as well as being “internationalised”, it could also facilitate the spread of good policy practice.

#### 4. Prioritisation criteria

Prioritisation criteria can help to achieve more strategic and effective disbursement of public finance in cases where demand for finance exceeds supply. Before agreeing on possible prioritisation criteria, overall principles can help to provide guidance on what useful prioritisation criteria may be. At the 7th AWG-LCA meeting, for instance, the following principles were proposed: equity and common but differentiated responsibilities, cost-effectiveness, demand-driven support, development and enhancement of endogenous capacities and technologies, a fair distribution of benefits across all economic sectors and a link with MRV efforts (UNFCCC, 2009f).<sup>25</sup>

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<sup>23</sup> According to the AWG-LCA non-paper No.51, ‘enabling activities such as preparation and elaboration of low-emission development plans and strategies and planning and elaboration of NAMAs, and related capacity-building, carried out by developing country Parties shall be supported on the basis of the agreed full costs’ (UNFCCC, 2009e).

<sup>24</sup> The PPCR for instance aims at integrating consideration of climate resilience in national development planning consistent with poverty reduction and sustainable development goals The Millennium Development Goals (MDG) Achievement Fund overseen by UNDP for instance includes ‘supporting policies and programmes that have significant and measurable impact on achieving specific MDGs’ as an overarching criterion for recipient’s eligibility. See for more details ‘UNDP/Spain Millennium Development Goals Achievement Fund Framework Document’ at <http://www.undp.org/mdgf/docs/MDGF-FrameworkDocument.pdf>

<sup>25</sup> Some of the principles underpinning effective financial mechanism discussed at the 7<sup>th</sup> AWG-LCA meeting are also relevant to the prioritisation criteria. For instance, one of the principles states that Parties’ access to funds is inversely proportional to their contribution to greenhouse gases in the atmosphere. Other principles include mutual accountability, country ownership, alignment and harmonisation (from donor’s perspective), focus on results with a compliance mechanism and sound public financial management taking into account the principles of aid effectiveness as set out in the Paris Declaration on Aid Effectiveness, and in accordance with internationally agreed environmental and social standards and safeguard policies (UNFCCC, 2009f).

In the past, many existing funds, particularly bilateral ones, allocated their resources based on a ‘first come, first served’ principle. For example, the GEF Trust Funds used to provide funding based on such a principle before they introduced the RAF in 2006. Though such an allocation approach could accelerate the disbursement of public finance, there are many drawbacks associated with it. These include perceptions of unfairness, limited access to funds and ineffectiveness of support (ODI, 2005). For instance, a ‘first come, first served’ approach may advantage to bigger or better-organised recipient countries that have the capacity and resources to prepare proposals for funding or projects from capital-intensive sectors, and disfavour smaller countries, even if they have greater mitigation potential. In addition, such an approach would not enable funds to maximise the cost-effectiveness of overall support to the recipient countries or projects, in this case in terms of GHG reductions.

There could be several different criteria to prioritise funding requests, and these may differ across funds. These include e.g. a focus on particular countries or sectors; the recipient country’s mitigation potential, sectors with high mitigation potential, mitigation actions’ ability to leverage private investment, or the replicability and scalability of projects as explored below.

#### 4.1 Focus on particular countries

Multilateral or bilateral funds may prioritise countries for support by their mitigation potential (*e.g.* Gt CO<sub>2</sub>-eq/USD), level of development (*e.g.* human development index, GDP per capita, eligibility for ODA) or the regions where they are located in.<sup>26</sup> There are precedents for this, with some funds targeting a specific group of countries (*e.g.* the SREP and the Least Developed Countries Fund (LDCF) – as well as some of the WB’s carbon funds).<sup>27</sup> The International Forest Carbon Initiative (IFCI) by the Australian government also indicates its priority for selected developing countries in South East Asia and the Pacific region.<sup>28</sup>

One important criterion for prioritisation could be mitigation potential in recipient countries. Indeed, the GEF brought both country’s mitigation potential and implementation capacity together as allocation criteria through the Performance-Based Resource Allocation Framework (RAF). Under the RAF, a system adopted by the GEF Council in September 2005, the share of funds awarded to countries is based on their potential to generate global environmental benefits and their capacity, policies and practices to successfully implement GEF projects.<sup>29</sup>

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<sup>26</sup> Some of the eligibility criteria proposed at the 7<sup>th</sup> AWG-LCA meeting (*e.g.* national and regional development priorities; natural and geographical characteristics; resource endowment; relative size of the economy; economic and technical capacity; position on the human development index) could also be used for prioritisation. See section 3.

<sup>27</sup> Funds could target certain countries by coordinating or bundling several funding sources. The form of a co-ordination mechanism could vary and could be both at the national or international level. For instance, donor countries could call for an ad hoc meeting for bilateral funders who prioritise certain countries or regions. Another option is to set up a secretariat which could facilitate support for prioritised countries or regions.

<sup>28</sup> South Korea has also called for creating an East Asian Carbon Fund to help formulate carbon reduction policies and implement pilot projects in the countries in the region (Business green, July 2008).

<sup>29</sup> In order to measure each country’s mitigation potential, the GEF uses the Global Benefits Index for climate change (GBIcc) which provides a relative ranking of countries for meeting the climate change objectives of the GEF. The GBI is a measure of each country’s potential to generate global environmental benefits in a particular focal area. Separate indices are determined for the biodiversity and climate change focal areas. The index consists of two indicators: 1) baseline GHG emissions for the year 2000 in tons of carbon equivalent for the latest year available; and 2) Change in carbon intensity (from 1990 to latest year for which data is available). The new GEF STAR will also include an indicator for forest cover. The GEF Performance Index (GPI) is used to measure a country’s capacity, policies and practices relevant to successful implementation of GEF projects and programmes. The GEF PI relies on World Bank country policy and institutional assessment data and on GEF programme evaluation data (UNFCCC, 2007a). The GPI however has been criticized for its lack of clarity, transparency and

The GEF Secretariat has recently outlined a new system called “STAR” (System for Transparent Allocation of Resources) in order to improve the RAF design and indices for the climate change and biodiversity focal areas for GEF-5 (GEF, 2009b; GEF, 2009c; Box 2).<sup>30</sup>

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**Box 2: New GEF System for Transparent Allocation of Resources (STAR)**

In November 2009, the GEF Council changed its system for determining country allocation to the new System for Transparent Allocation of Resources (STAR), in three focal areas (climate change, biodiversity and land degradation). The GEF’s revised Global Performance Index (GPI) would still comprise three indicators for each country: The Country Environmental Policy and Institutional Assessment Index (CEPIA), which assesses environment related policies and institutional frameworks; the Broad Framework Indicator (BFI), which looks more generally at public sector management and institutions; and the Project Portfolio Index (PPI), which assesses the results of GEF programmes.

The new GPI would reduce the weight of the first two indicators, both based on World Bank’s International Development Association’s (IDA) Country Policy and Institutional Assessment (CPIA). While the weight of both CEPIA and the BFI will be reduced from 70% to 65%, and 20% to 15% respectively, a greater weight (20% instead of 10%) will be given to the PPI. The new PPI would be based on the implementation progress ratings of the country’s project implementation reports (PIR) and the terminal evaluation reports’ (TER) ratings on project outcomes with a greater weight given to the latter due to their more precise assessment of the project outcomes at the end.

Under the STAR, a GDP-based index will also be included, though its weight is relatively low. It will have negative exponential power (the index will be the GDP/capita is to the power of a negative number) in order to provide a higher individual allocation for countries with a lower GDP per capita. The Global Benefits Index for the climate change focal area (GBIcc) is also modified to include a forest cover indicator, weighted at 5% while GHG emissions continue to account for 95%. Like GHG emissions, the forest cover indicator will include an adjustment factor that rewards countries showing decreasing loss of forests over time. As the GHG emissions used in the indicator do not include land-use change, the new forest cover indicator is intended to act as a proxy for emissions from such activities.

Source: [http://www.gefweb.org/interior\\_right.aspx?id=24142](http://www.gefweb.org/interior_right.aspx?id=24142); GEF, 2009c.

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discrepancy with country growth rates and the UNDP’s Human Poverty Index (GEF, 2009b). For more information, see [http://www.gefweb.org/interior\\_right.aspx?id=17104](http://www.gefweb.org/interior_right.aspx?id=17104).

<sup>30</sup> A revised GPI is proposed based on a set of refined indicators (*e.g.* transparent and publicly available) (GEF, 2009c).

If funds wish to prioritise small and low income countries and ensure that they would have an equal opportunity to benefit from available resources, one way of doing so could be to agree on a quota for these countries or set a minimum or maximum threshold on funding amounts.<sup>31</sup> As often experienced in the past, small and low-income countries face bigger challenges in terms of accessing available funds due to their limited capacity.<sup>32</sup> According to the GEF-4 report, big countries such as China, India and the Russian Federation received the largest allocations under the RAF formula, followed by Brazil, Mexico and South Africa (GEF, 2006). Large countries also account for the largest proportion of expected credits under the CDM.

Another way of ensuring more equitable resource allocation would be to set a threshold on the maximum amount of resources that one country could receive. The Climate Investment Fund (CIF), for instance, has set such a threshold that no one country will receive more than approximately 15% of the Trust Fund resources and allocation should be technology neutral and divided into three sectors (power, transport, energy efficiency). According to the STAR, the GEF has also set a minimum threshold (USD two million for each eligible country during a four-year GEF phase) as well as a maximum threshold (the total amount that a country can receive from the GEF climate change focal area cannot exceed 11 per cent of the resources available) (GEF, 2009c). The use of quotas or thresholds however might work best when there is a consistent governance system for matching support and requests (this is discussed further in section 6).

Funds could also classify countries in other ways, and prioritise accordingly. For example, the UN-REDD, FIP and the CTF prioritise countries with high mitigation potential, particularly long-term GHG emissions savings (UN-REDD, 2008; World Bank, 2009a; World Bank, 2008a). The FCPF and the SREP also prioritise countries with large forest area and high carbon stocks and renewable energy resources potential respectively (FCPF, 2008).<sup>33</sup>

## 4.2 Sectors with cost-effective mitigation potential

When deciding on disbursement of funds to support post-2012 mitigation actions in developing countries, certain funds, including funds created at the national level (such as Indonesia's climate change trust funds), may also decide to focus on particular sectors.<sup>34</sup> Such sectors could include, for instance, those with high mitigation potential in the longer-term but high start-up/investment cost (such as carbon capture and storage), or with cost-effective mitigation potential (such as energy efficiency, waste). Priority areas or sectors might be identified specifically by each fund and/or host country, or an allocation method that implicitly identifies the most cost-effective actions – for example through an inverse auction or tendering process – could be used (see section 5.1.1). Such a sectoral focus already happens in current climate-specific funding. For example, the GEF Trust Fund prioritises four operational programmes approved by the GEF Council<sup>35</sup>, which are based on four strategic programmes

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<sup>31</sup> A quota or threshold on funding amount could also contribute to a better geographically balanced and accountable resource allocation.

<sup>32</sup> Often, there is also lower interest of mitigation activities in such countries as transaction costs are higher but mitigation potential is smaller.

<sup>33</sup> In order to demonstrate such mitigation potentials, ex-ante monitoring and evaluating schemes for the impact of mitigation actions associated with such potentials could be carried out. The MDBs jointly assess the potential for investment in the recipient country based on the CTF eligibility criteria including significant GHG emissions savings, demonstration potential at scale, development impact and implementation potential (World Bank, 2008a; World Bank, 2008b).

<sup>34</sup> For instance, the Indonesian climate change trust fund, support is aimed in three areas (energy, agriculture/forestry, resilience) (Bratasida 2009).

<sup>35</sup> Four operational programmes are 1) removal of barriers to energy conservation and efficiency; 2) promotion of the adoption of renewable energy by removing barriers and reducing implementation costs; 3) reduction of the

for mitigation<sup>36</sup> (UNFCCC, 2007). Moreover, funds could prioritise certain types of mitigation actions or project/programme types using specific technologies e.g. the SREP is dedicated to supporting renewable energies).

Sectors could be prioritised at the international level, for instance, by the highest economic mitigation potential, and/or in accordance to other criteria (e.g. as identified in a recipient country's development plan). According to the IPCC fourth assessment report (IPCC, 2007), at less than 100 USD/t CO<sub>2</sub>-eq, the estimated economic potential for global mitigation in developing countries (i.e. countries that are not OECD members or Economies in Transition (EIT)) ranges from 8.3-16.8 Gt CO<sub>2</sub>-eq, with estimates varying by sector (see Table 1). Industry, agriculture and buildings rank in the top three for both the low-range and high-range economic potential estimates, while the waste sector appears to have the lowest economic potential (see Annex III).

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long-term costs of low GHG emitting energy technologies; 4) promotion of environmentally sustainable transport (UNFCCC, 2007a).

<sup>36</sup> The strategic programmes for mitigation are: a) promoting energy efficiency in residential and commercial buildings; b) promoting energy efficiency in the industrial sector; c) promoting market approaches for renewable energy; d) promoting sustainable energy production from biomass; e) promoting sustainable innovative systems for urban transport; f) management of land use, land-use change and forestry (LULUCF) as a means to protect carbon stocks and reduce GHG emissions (UNFCCC, 2007a).

Table 1: Investment needs, mitigation potential and mitigation cost estimates by sectors in developing countries in 2030

Sector	Areas/mitigation measures considered	Amount needed in developing countries (USD billion)	Economic potential for <100 USD/t CO <sub>2</sub> -eq (Gt CO <sub>2</sub> -eq)	
			Low	High
Energy supply**	Low production due to reduced demand and greater use of biofuels	-35.29*	1.3	2.7
	Low fossil-fired generation capacity			
	More renewables			
	Carbon dioxide capture and storage			
	Nuclear energy			
	Hydropower			
Industry	Greater energy efficiency	19.44	1.6	3.8
	Carbon dioxide capture and storage			
	Reduced emissions of non-CO <sub>2</sub> gases			
Buildings	Greater energy efficiency	14.28	2.7	3.3
Transportation	More fuel-efficient vehicles	35.2	0.15	0.15
	Greater use of biofuels			
Waste	Capture and use of methane from landfills and wastewater plants	0.64	0.20	0.70
Agriculture	Reduced methane emissions from crops and livestock	12.95	1.6	4.5
Forestry	Reduced deforestation and forest degradation	20.79	0.75	3.0
	Sustainable forest management			

Source : UNFCCC, 2008a; UNFCCC, 2009; IPCC, 2007

\* The mitigation scenario projects less investment in fossil-fired generation capacity and transmission and distribution, while additional investment is projected for CCS for coal-and gas-fired generation, renewable, nuclear and hydro (Haites, 2008).

\*\* The amount needed in developing countries (USD billion) for the energy supply section combines those from both the fossil fuel and power supply sectors.

### 4.3 Ability to leverage private finance

Given the greater potential of private sector finance for mitigation actions post-2012, the ability of public finance to leverage private investments for GHG mitigation actions could be an important aspect for the actions' successful implementation and sustainability, and thus an option for prioritising funding. The importance of leveraging private finance was also acknowledged and incorporated as one of principles to guide the operationalisation of an effective financial mechanism (UNFCCC, 2009f). By

providing an enabling environment which encourages domestic and foreign private investment, such an ability to leverage private finance could enable support to achieve longer term, more ambitious mitigation goals. In this regard, the goal of mitigation actions should be providing incentives for clean development into sectoral and other policy frameworks to guide private investment to green technology and practices increasingly over time (Kim et al., 2009).

The FIP, for instance, aims at facilitating scaled-up private investment in alternative livelihoods for forest dependent communities and prioritises projects with private sector partnership. The CIF requires ‘co-financing’ as an eligibility criteria.<sup>37</sup>

#### 4.4 Replicability, scalability and transformative impact

Public resources can play a key role in kick-starting mitigation actions which can then be scaled-up or replicated with private finance and, in the longer term, be economically sustainable, and/or mainstreamed into national planning. Thus, the potential of actions’ replicability on a wider scale could be an important factor in prioritising support.

Several funds do in fact look at scalability and replicability to target projects for support, such as the UN MDG Achievement fund, the PPCR, the SREP, and the CTF. The CTF for example targets technology deployment, diffusion and transfer. It considers the scope of avoided GHG emissions that would result from replication of the project it co-finances and examines the project’s potential to result in market transformation. Prioritising such activities could increase the likelihood of delivering sustainable mitigation or adaptation benefits.

The SREP also supports projects with investment levels that are sufficient to sustain operations and maintenance and that will have a transformative impact, i.e. remove barriers to deployment, be replicated and lead to greater production and consumption of renewable energy. The fund’s proposed results framework will monitor these transformative impacts through various indicators, such as increased volume of renewable energy production, the number of people with access to renewable energy, the economic internal rate of investment returns, the number of enterprises and employees in renewable energy businesses and the number of enterprises that use renewable energy (World Bank, 2009c).

#### 4.5 Development impacts or co-benefits

Prioritisation could also be based on criteria related to development impacts and/or the ability to achieve non-climate co-benefits (*e.g.* reduced local air pollution and ecosystem benefits) of mitigation actions.<sup>38</sup> In-country funds – such as those in Bangladesh and Indonesia - that centralise provision of support may be particularly well-placed to take such considerations into account when prioritising support. However, all funds reviewed in Annex II take sustainable development benefits into account when prioritising activities for support. The CTF for instance, requires mitigation projects to assess their development impacts in order to demonstrate that low-carbon technologies can contribute to sustainable development. The CTF also prioritises projects with investment proposals which have greater potential to increase household electricity access rates, access to mobility, the reliability of power for business and industry, reduce energy supply costs and address the impacts of pollutants on health and environment.

Increased non-GHG related benefits of mitigation actions such as sustainable development could also improve the long-term impact of supported mitigation actions. The FCPF for example, states that potential GHG mitigation benefits associated with REDD will not be sustainable unless the underlying drivers of deforestation and degradation are addressed, notably poverty. It thus aims to improve

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<sup>37</sup> Projects financed with GEF grants are typically co-financed by other sources, but they are not limited to private investment (UNFCCC, 2009c).

<sup>38</sup> Some of co-benefits (*e.g.* access to energy, supporting local enterprises) are also incorporated in the transformative impact indicators.

livelihoods by securing property or user rights for local communities. Potential for biodiversity co-benefits are also considered.

## 5 Using prioritisation criteria to allocate support

Consistent prioritisation criteria could help strategic allocation of support. Funds could use either a single or multiple prioritisation criteria to allocate support. This section explores different ways of using prioritisation criteria to help target and disburse public finance.

### 5.1 Allocating support based on cost-effectiveness criterion

Support could be allocated based on the most important prioritisation criterion that funds consider. If funds consider cost-effectiveness (either of a sector or mitigation actions) as the most essential prioritisation criterion, financing could be allocated by using a tendering process or an inverse or reverse auction (henceforth referred to as inverse auction).

In a *tendering or bidding process*, competing offers to provide goods or services for the lowest price are made to an organisation or agency with limited funds to disburse. Participants are informed in advance of the criteria for evaluating the selected tender or bid, generally based on the costs and benefits. Prior to approval, a review panel reviews received tenders based on the announced criteria.<sup>39</sup>

Tendering is widely used by national governments or large companies in providing public goods/services or international development assistance. The United States Department of Agriculture and the Australian Queensland Government, for instance, examined their use of tenders for various agricultural programmes and concluded that the use of tenders was more cost-effective than non-bidding programme designs, such as flat-rate payments on a first-come first-served basis (Comerford *et al.*, 2006; Johansson, 2006). For the same cost, environmental effectiveness was enhanced since proposals with the largest benefits could be selected, and participants could propose projects that make use of otherwise neglected resources. In addition, participants could indicate that they are willing to undertake certain conservation activities at a lower cost than could have been estimated by the programme managers.

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#### Box 3: Awarding local contracts through tendering in a large-scale project

Within large-scale projects, tendering is often used to award local contracts for the provision of services or the supply of goods. A seven-year GEF project targeting industrial boilers in China, for instance, used a tendering process to select boiler technology suppliers as part of the project's technology transfer component. This process was considered too cumbersome and lengthy in hindsight, as a full-competitive, two-stage bidding process (in line with the World Bank's procurement guidelines) caused major delays in the project's execution (World Bank/GEF, 2004).

As a bilateral example, the Dutch energy agency, SenterNovem, oversees a Global Sustainable Biomass scheme which provides grants for projects targeting the production of sustainable biomass in developing countries. Grants are provided through a tendering process, and for the first round of disbursement 23 proposals have been received, requesting between EUR 60 000 to EUR 1 million (the maximum amount) in grants from an envelope of EUR 6.5 million (SenterNovem, 2009).

Source : World Bank/GEF, 2004; SenterNovem, 2009

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<sup>39</sup> While most organisations have established rules governing the tendering process (their procurement guidelines), individual tenders could be tailored to meet a variety of needs since criteria could be specific to the goods or services requested.

**Inverse auctions**,<sup>40</sup> also known as “procurement auctions”, typically refer to multiple sellers competing to sell goods or services to a single buyer, while standard auctions involve multiple buyers competing to buy goods or services from a single seller. In the context of matching mitigation support for mitigation actions, it refers to a process where a given amount of funds is disbursed through a competitive bidding process and potential recipients of mitigation support would compete to deliver the “best” package in terms of GHG reductions in a given period per unit of mitigation support available (Kim et al., 2009).

Bidding participants could be individual mitigation project managers, developers or governments from developing countries – this may need to be specified *ex ante* by funds, in order to streamline the process. The two key components of the inverse auctions are the bidding process and the pricing information. Typically, bidding participants tend to inflate their bidding price in order to maximise the amount of funding received. The competitive bidding process provides the participants an incentive not to inflate their bid beyond the minimum price required to implement or install the relevant practices as an inflated bid risks being rejected by the buyer.

The pricing information is important for inverse auction administrators to minimise the cost of achieving programme goals. Empirical evidence suggests that when the demand for finance exceeds supply, competitive bidding based on inverse auctions coupled with the use of performance-based indices is a more cost effective strategy for allocating finance (Wunscher *et al.*, 2008; Selman *et al.*, 2008) (See Box 4).<sup>41</sup> According to Wunscher (2008), such an auction system might also be able to make payment differentiation politically acceptable, as payment recipients themselves suggest the price.

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**Box 4: Comparison of the average cost-effectiveness between inverse auction and the Environmental Quality Incentives Programme (EQUIP)**

An empirical study on the allocation of conservation funding for the Conestoga watershed in Pennsylvania shows that an inverse auction is more cost-effective than the traditional funding allocation process used in the US Department of Agriculture’s Environmental Quality Incentives Programme (EQUIP). The study shows that the inverse auction on average reduced phosphorus runoff seven times more per dollar spent compared to EQUIP during the same period.

Source: Selman *et al.*, 2008

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A number of options are available for bidding strategies (Selman *et al.*, 2008).<sup>42</sup> If the principal goal of auctioning is to achieve the cost-effective use of funds, bids could be ranked and funded based on a combination of both costs and emissions reductions, which allows programme administrators to maximise mitigation results given limited funds (“bid for cost-effectiveness”). Assessing cost-effectiveness would require quantitative measures of emissions reduction such as *ex-ante* assessments. *Ex-post* monitoring and evaluating of the actions could also be done as part of a verification process. It

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<sup>40</sup> While the primary purpose of inverse auction is to maximise the cost-effectiveness of funding resources, they could be designed to accommodate different objectives (Wunscher *et al.*, 2008). For instance, a cost-sharing payment scheme (*e.g.* payment covers no more than 50 percent of estimated projects costs) could be envisaged in order for a greater engagement and ownership of the participants in the mitigation projects, although it may result in a lower “willingness to accept” among participants. Restrictions could be put on the maximum price that participants could bid in order for the funds to be disbursed to greater number of participants or to keep the total contract expenditures under a certain level.

<sup>41</sup> A few factors account for the high rate of cost-savings in the inverse auction compared to conventional prioritisation of projects in funding allocations: one of which is that more environmental resource concerns could be taken into account in the case of the latter; criteria other than cost-effectiveness, such as equity concerns could be considered in the case of conventional prioritisation.

<sup>42</sup> If the objective of the inverse auctions is to reduce the cost, bids could be ranked according to cost and winning bids are funded from lowest to highest cost (Selman *et al.*, 2008).

should be borne in mind that while inverse auctions can enhance the cost-effective disbursement of limited public finance, they may have higher transaction costs (Ferraro, 2007).<sup>43</sup>

## 5.2 Allocating support based on other or multiple prioritisation criteria

Other criteria may be used to prioritise the allocation of support from various funds— particularly if support is being used with the aim of increasing deployment/bringing down costs of promising technologies and/or if mitigation actions are directed at several sustainable development policy goals (e.g. reducing negative health impacts) as well as mitigation aims. Thus, when there are multiple prioritisation criteria that funds consider important for strategic allocation of support, one way of allocating funds is to score mitigation actions for each of the selected prioritisation criteria, and then combine these scores in an index to rank and prioritise actions for support.<sup>44</sup> For instance, mitigation actions could be scored in terms of the partner (host) country's level of development or mitigation potential. To this end, *ex-ante* monitoring and evaluating schemes of the mitigation actions' impact could be carried out by using indices similar to Global Benefits Index for climate change (GBIcc) or the Human Development Index.<sup>45</sup>

Mitigation actions could also be scored in terms of their economic mitigation potential. . For instance, mitigation actions undertaken in a sector with a high economic potential for global mitigation could be scored higher. Sectors with cost-effective mitigation potential (both national international) could also be scored by carrying out cost-benefit analysis (*i.e.* including non-GHG benefits) as well as cost-effective analysis (*i.e.* focused on GHG benefits only).

Any scoring system could be used to set a threshold for mitigation actions which could receive support (e.g. support would be provided for actions which score above the threshold), to rank mitigation actions for support (e.g. those ranked in the top X% would receive support), or to provide guidance on which actions could be prioritised.

## 6. Institutional options for matching mitigation actions with support

Support for developing country actions that help to mitigate GHG emissions is already occurring (and is likely to continue post-2012) via several different channels (Corfee-Morlot *et al.*, 2009). This includes:

- bilateral public support such as ODA that can be focused on mitigation-specific or sectors relevant to mitigation (e.g. energy, transport or forestry). This could include activities such as the Indonesia-Australia forest carbon partnership (GoA, 2008; GoI, 2008);
- multilateral public support delivered e.g. via international financial institutions and/or multilateral development banks;
- multilateral public-private support for carbon market actions, such as the World Bank's Prototype Carbon Fund (whose contributors include governments from several countries, as well as companies), and

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<sup>43</sup> In general, inverse auctions also require a large pool of bidders in order to create competitive pressures and to discourage collusion. See Annex IV for more detailed information on payment and bidding rules.

<sup>44</sup> Under the LDCF, criteria developed for selecting priority activities in the National Adaptation Plan Action (NAPAs) is scored and ranked based on the guidance on the use of cost-benefit analysis (CBA), cost-effectiveness analysis (CEA), and multiple criteria analysis (MCA) to prioritise adaptation activities in LDCs (Karousakis and Corfee-Morlot, 2007).

<sup>45</sup> The EU proposed *ex-ante* analysis or *ex-post* review to ensure that mitigation actions deliver cost-effective, measurable and additional GHG mitigation and to evaluate the support needs to implement the mitigation actions (EC, 2009a; EC, 2009b).

- other carbon market actions, notably through unilateral CDM projects in developing countries.

Several governance options could be envisaged to channel support to mitigation actions in the post-2012 climate regime. These range from a more centralised approach (*e.g.* with a fewer number of multilateral/bilateral funds providing support) to a more decentralised approach (*e.g.* with a greater number of multilateral/bilateral funds providing support.) By November 2009, there were still several options on the negotiation table regarding how many multilateral funds would be included in a post-2012 funding mechanism, as well as on how they would be governed and by which institutions.

Both more centralised and decentralised approaches have advantages and disadvantages. For example, channelling support to GHG mitigation actions via a smaller number of funds could help to increase consistency in decision-making (*e.g.* regarding prioritisation for disbursement), and could also allow funds to set strategic priorities, such as balancing support between particular countries, sectors or programmes.

Channelling support in a more decentralised manner (as with the current multiplicity of routes) also has advantages. For example, using multiple funds to channel support for GHG mitigation action reduces the administrative burden on any one institution, and it also allows different funds to develop expertise and specialise on specific areas for support. Decentralised funding (*e.g.* via bilateral routes) could also allow for greater donor influence on *e.g.* the country or sector where support is directed.

In a post-2012 climate framework where both the level of support and the level of mitigation actions is likely to be greater than at present, matching support and actions will have institutional and governance implications. These implications would depend on whether:

- A dedicated mechanism to match support with GHG mitigation actions is needed, and if so, whether it would be part of/within the support funds themselves or separate;
- Greater co-ordination and coherence is achieved via increased communication between funds *e.g.* periodically bringing funds together in one forum.
- A centralised matching mechanism would “co-ordinate” different multilateral and bilateral sources of support (*e.g.* to highlight gaps in funding for particular areas, or to help in prioritising funding in a more consistent manner), and if so, how.

This section explores institutional and governance-related implications of channelling support to GHG mitigation actions in a post-2012 climate framework, and outlines current experience with matching support with support needs (for climate, as well as for other issues).

## **6.1 Is a matching mechanism needed, and if so, how could it work?**

In order to be able to make decisions on which GHG mitigation action to support, information on these potential mitigation actions and their support needs will need to be available internationally. This could be done in different ways, *e.g.* via an “institutionally light” process where information on possible mitigation actions and their support needs is highlighted in a registry or other information exchange; via a new institution such as a facilitative platform, mechanism or clearinghouse that is dedicated to matching support needs and support; or some sort of middle ground, which involves increased co-ordination, but no new institutions. A varying degree of co-ordination and a range of governance structures in these different possible matching mechanisms are outlined in Figure 2, below.

### **6.1.1 Using a mitigation actions registry for an information exchange**

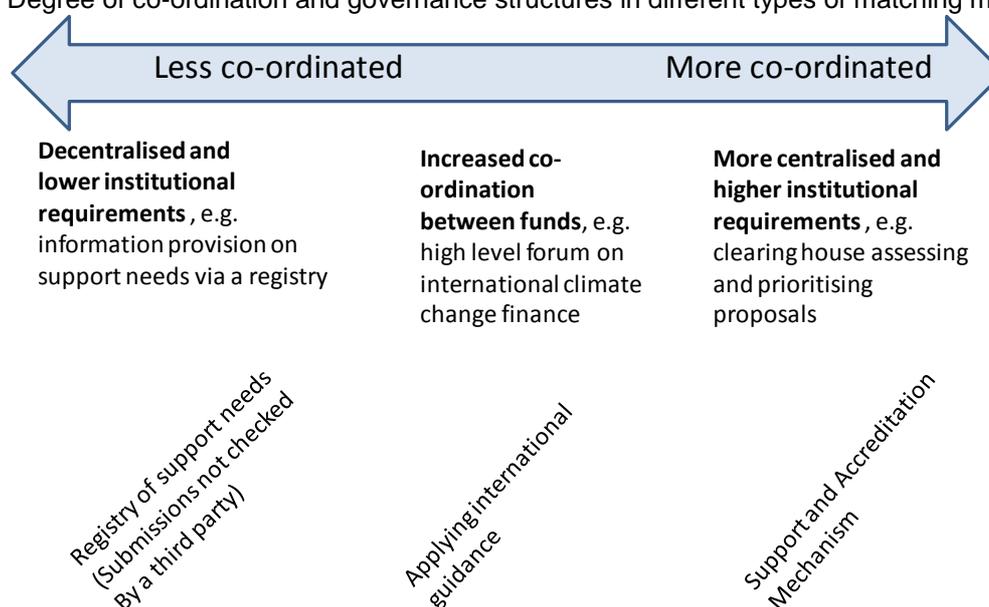
Figure 2 highlights the situation that could occur if a registry of mitigation actions and support was used as the depository for information on potentially supported mitigation actions in developing countries, and

support provisions from developed countries. In such a system, “matching” could occur in an un-coordinated manner.

Thus, bilateral and/or multilateral funds could use a registry to view mitigation actions needing support, and choose to support some of these actions. Such choices could be based on formal (*e.g.* scoring system) or informal criteria to prioritise disbursements, and could vary depending on the fund. Alternatively, countries seeking support for mitigation actions could use the registry to identify potential bilateral or multilateral donors. Information on support given and received for a particular mitigation action would then also need to be reported in the registry, to ensure that the status of support still needed, and that provided, is clear.

This type of “matching” would not require additional institutions or governance *per se* (other than those associated with a registry of mitigation actions and support). It would also allow different funds to use different criteria in order to prioritise their support. However, this type of decentralised “matching” could also lead to support being directed in an uneven/inequitable manner to different countries and sectors.

Figure 2: Degree of co-ordination and governance structures in different types of matching mechanisms



Source: Authors

### 6.1.2 Some co-ordination of the matching process

Rather than having no co-ordination of the matching process (as described above), some limited co-ordination of the matching process could be desired. This could be done via increased international co-ordination between different funds, increased national co-ordination by recipient countries, and/or by applying any international guidance regarding how to assess requests for support (see Figure 2).

**Increased institutional co-ordination** (at the fund/donor level and/or within recipient countries) could be used to set priorities for funding. For funds, this could involve *e.g.* periodic meetings of the Boards of different funds or ad-hoc meetings of bilateral funders. For recipient countries, this could involve inter-ministerial consultation and/or other processes to identify national funding priorities.

The international community has already indicated its awareness of the need for co-ordination to help increase the effectiveness of aid. Indeed, increased co-ordination between donors, as well as between donors and recipient countries, is explicitly mentioned in the Paris Declaration on Aid Effectiveness (2005 – of which 132 countries are signatories) and the Accra Agenda for Action (2008). In development

co-operation, this is referred to as “harmonisation” and “alignment” respectively.<sup>46</sup> In seeking for a better co-ordination on the donor side to deliver the Paris Declaration commitments, donors are increasingly geared towards joint approaches and using pooled funding mechanisms and common assessment frameworks<sup>47</sup>. For example, the Nordic Plus donors<sup>48</sup> increasingly use delegated co-operation<sup>49</sup> and joint financing, and have developed a number of guidance documents to facilitate harmonisation amongst themselves (OECD, 2009b).<sup>50</sup>

Increased institutional co-ordination at the level of the recipient country could also help ensure that funds were disbursed according to their national priorities. This is done in other areas: for example the Global Fund to fight Aids, Tuberculosis and Malaria (henceforth “The Global Fund”) has established “country co-ordinating mechanisms” (TGF, 2009c). In the area of climate change, Bangladesh has also proposed co-ordination, creating a “multi-donor trust fund”, where contributions from international donors will be used to help Bangladesh implement its Climate Change Strategy and Action Plan (USAID, 2009). For example, the Bangladesh government together with donors such as the World Bank, ADB, UK and Japan, have agreed on a set of priority reforms in the transport sector, based on the government’s National Land Transport Policy (ADB 2008). In September 2009, Indonesia also launched its national “Climate Change Trust Fund”, which aims to help integrate climate change into development planning as well as to increase the effectiveness and impact of external funding for climate change mitigation and adaptation activities (Bratasida 2009).

Increased institutional co-ordination would have both advantages and disadvantages. If it leads to a more streamlined institutional procedure, this could result in more rapid decisions on which actions will be supported and how. However, whether this occurs in practice will depend on detailed governance rules, such as how many participants participate in funding decisions; how such decisions are made (*e.g.* via meetings, or written procedures); how often such meetings occur; what the voting rules are (*i.e.* whether decisions are made by consensus or not). Such rules for funds currently operating are outlined in section 6.2. Grouping decisions on funding, and also contact with recipient countries, could help reduce transaction costs, both for donors and recipients (*e.g.* via reducing meeting/travel time). It could also increase coherence between funds, for example in agreeing minimum eligibility requirements for funding (*e.g.* the existence of a LEDS). Increased co-ordination could nevertheless allow some flexibility to funds to support different types, locations, sectors etc. of mitigation actions, depending on the fund’s eligibility criteria and priorities.

Applying *internationally-agreed guidelines* could also help to increase coherence and co-ordination of dealing with different funding requests. The content of this guidelines could vary, and could include general criteria (*e.g.* that support adheres to the principles of aid effectiveness); institutional or governance criteria (*e.g.* who is responsible for programme development, whether programme reviews and/or financial audits are required, what sort of monitoring is required); requirements on the mitigation action itself (*e.g.* that it should be at a programme/sectoral level); or be more detailed (*e.g.* outlining

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<sup>46</sup> Commitments for greater harmonisation include: common arrangements for planning, funding, disbursement, monitoring, evaluating and reporting; reduce separate, duplicative missions and reviews; and make use of comparative advantage by delegating authority. In addition, donors are encouraged to move towards supporting programme-based approaches, sector-wide approaches, and providing direct budget support (OECD, 2009b).

<sup>47</sup> Experience with global funds in the health sector has shown however that the mandates and processes of different funds make alignment and harmonisation difficult. Each funding mechanism tends to have its own administrative and reporting requirements, which overburden recipient country capacity

<sup>48</sup> These are UK, The Netherlands, Finland, Sweden, Norway, Ireland, and Denmark.

<sup>49</sup> Under “delegated co-operation”, one donor acts as a “lead donor” - for a specific project, element, sector programme or country programme - with other donors acting as silent partners.

<sup>50</sup> However, donors face some deep-seated incentive issues that prevent greater harmonisation and parallel financing still remains prevalent. There is also concern that greater harmonisation may inadvertently, undermine national ownership (OECD, 2009b).

information to be submitted as part of a support request)<sup>51</sup>. Moves towards using country procurement systems and budget cycles, as well as using more joint and harmonised procedures, are slowly occurring with the global funds in the health sector and can also provide guidance for climate change financing (OECD, 2009c).

### **6.1.3 Using a single fund or centralised clearinghouse to match support with needs**

At the other end of the co-ordination spectrum would be a situation where there was more centralised co-ordination of the matching process. Different proposals and experiences for such a mechanism are outlined below.

A *centralised clearinghouse* for mitigation actions and support could be developed. This could either be developed as part of a mitigation actions registry, or separately. In such a clearinghouse, a body (*e.g.* an institution set up specifically for the purpose of matching) could assess requests for funding as they are submitted (*e.g.* providing a check for completeness, quality and consistency) and prioritise funding requests for funders' action. There are precedents for this type of support governance in areas such as health and biodiversity, *e.g.* in the (established) "technical review panel" of the Global Fund, and the (planned) "Lifeweb" clearinghouse for protected area financing under the Convention on Biological Diversity<sup>52</sup>.

This type of process (*i.e.* evaluation of funding proposals and potentially also other functions by an institution under the COP) has also been suggested in the UNFCCC context by different bodies (*e.g.* Saudi Arabia's proposal for a "support and accreditation mechanism").<sup>53</sup> Mexico's suggested "Green Fund" also indicates that it would require an operational body to supervise the fund (with membership from both developed and developing countries).<sup>54</sup> Other proposals include those for a "facilitative platform" and an "entity for co-ordination and matching".

There is also experience with operating large and/or centralised funds. For example, the Global Fund is at a larger scale than many climate-related funds, having disbursed more than USD 15 billion via more than 570 programmes since its inception in 2002 (TGF, 2009a). Its technical review panel, which comprises up to 40 experts, reviews funding requests and makes proposals to the Board on which of these to fund (TGF, 2009b). However, it would be difficult for a board (and panel) meeting only periodically to process the potential volume of mitigation actions unless mitigation actions are defined at an aggregated level, *e.g.* a national-level low carbon development strategy (which would limit their numbers).

The Lifeweb initiative is planned to be run at the CBD Secretariat, with the Secretariat providing both the quality control and the "matching" function. However, as funding for this initiative is public-sector only (from 3 governments), its scale is much smaller than that of the Global Fund, in terms of money to spend, and in terms of proposals to assess.<sup>55</sup> This type of institutional arrangement is therefore unlikely to be appropriate for an assessment of support priorities for mitigation actions. Looking across both of these examples suggests that any clearinghouse operation on climate change, which might be at larger scales of funding, would require significant institutional capacity.

Channelling funding proposals through one supervisory body would also have advantages and disadvantages. The advantages are that the results should be internally consistent. Further advantages of a

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<sup>51</sup> Suggestions for such reporting requirements are outlined in an accompanying paper, Ellis *et al.* (2009).

<sup>52</sup> In neither case this is the sole source of funding. The clearing house function is the mechanism used to match support with needs in both the Global Fund, and in LifeWeb.

<sup>53</sup> Presentation given by Saudi Arabia at the AWGLCA workshop on 1(b) ii in Bonn, 1 April, 2009.

<sup>54</sup> Personal communication with the Mexican delegation.

<sup>55</sup> Personal communication with Jason Spensley, CBD Secretariat, 20.07.09.

centralised matching facility would be that this process would allow for strategic prioritisation of support (e.g. across countries and sectors, taking into account mitigation potentials). Indeed, the need to allocate funds “in a balanced manner” was recognised in the August 2009 negotiations (UNFCCC, 2009d). However, there are also disadvantages, including at the institutional level: a more centralised matching institution would either need to be very large and well-staffed, or would not be appropriate if mitigation actions can include activities at disaggregated levels (such as those based at the project, programme or city level). Another disadvantage with a centralised approach to matching support and actions would be in reaching agreement on prioritisation criteria, if a centralised approach to matching translates into requiring consistent prioritisation criteria across different funds.

## 6.2 Current experience with allocating support

As outlined above, the different funds that currently channel support (in the form of finance, technology or capacity building – or alternatively via the carbon market), have different eligibility and prioritisation criteria. Such funds can also have different governance structures, particularly with respect to who has the power to make decisions. These structures are outlined below for some selected funds, as they can help point what could work, and what could not work, in a post-2012 matching process for mitigation actions.

Newer funds tend to have a higher involvement of potential recipient countries on their Board. The increased involvement of recipient countries in more recent funds illustrates the growing recognition of the importance of involving these countries in decision-making, in order to allow support to be more effectively channelled towards country-driven priorities. For example, the governing committees of some newer funds, such as the Climate Investment Funds<sup>56</sup> (to which USD 6.1bn have been pledged by 12 countries)<sup>57</sup> include equal numbers of donor country and developing country governments, and decision is taken by consensus (Nakhooda, 2009).<sup>58</sup> A half of the members of the GEF council, which is the main governing body of the GEF are responsible *i.e.* for approving projects (GEF, 2009 and 2009b), are also from developing countries. Expert advice also plays a role (although indirect) in GEF funding decisions, as it is concentrated in the GEF’s scientific and technical advisory panel (STAP), which feeds into the GEF Council. In contrast, the Participants Committees of most of the World Bank carbon funds (*i.e.* who approves project selection)<sup>59</sup> comprise fund’s donors only.

By July 2009, 10 World Bank carbon funds had been operating for up to nine years (the oldest fund became operational in 2000). During this time, they agreed just over 100 Emission Reduction Purchase Agreements, with negotiations on other projects underway. The GEF has allocated USD 2.4bn to climate change activities between 1991 and 2008, via almost 600 different projects (GEF, 2009). Several of the GEF projects focus on capacity building and/or fulfilling countries’ reporting requirements under the UNFCCC, and are therefore not all directed towards projects with direct mitigation benefits. The CIF have only been in operation since 2008, so it is difficult to assess the efficiency or otherwise of the institutional process.

The focus of multilateral funds has a significant impact on how the performance of supported projects or programmes is assessed, and who carries out such an assessment. For example, the WB’s carbon funds focus on purchasing credits from the CDM or JI. Framework criteria for monitoring, reporting and verifying emission reductions were established in the Marrakech Accords (2001), with more detailed requirements being laid out in methodologies approved by the CDM Executive Board for individual

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<sup>56</sup> The CIF is made up of two funds: the Climate Technology Fund, CTF, and the Strategic Climate Fund, SCF.

<sup>57</sup> The 12 donor countries are Australia, Canada, France, Germany, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom and the United States.

<sup>58</sup> There is also representation from MDBs (and observers, including from the country for which investment is considered), although they do not participate in funding decisions.

<sup>59</sup> For some funds, general criteria on project selection (e.g. country or sectoral priorities) were agreed during establishment of the fund.

project types. Monitoring and evaluation also plays an important role in the GEF. GEF has developed minimum requirements for monitoring and evaluation for GEF-funded activities, which could be at project, programme (portfolio) or country level. These include a “concrete and budgeted” monitoring and evaluation plan, as well as an independent *ex post* evaluation for larger projects (GEF undated2). Such evaluation includes emission reductions from the projects funded, where appropriate.

## 7. Way forward

Amidst a divergence of views among countries on the design of the post-2012 financial architecture, the challenges to achieving an effective matching framework remain large. Several options for the operation of the post-2012 financial architecture were still on the negotiation table at the 7<sup>th</sup> AWG-LCA meeting (November 2009). One such option is to establish an entity for co-ordination and matching in order to provide technical assistance to developing countries to identify needs and financial resources and to facilitate matching between the two (UNFCCC, 2009f). Some ideas on the governance of such a mechanism have also been detailed in this proposal.<sup>60</sup>

Several decisions on the need for and key design elements of a possible “matching” framework are needed before such a framework can be advanced. Decisions on the operation of the financial architecture for the post-2012 framework (*e.g.* at COP15) are needed initially, including the principles and an indication on whether or not a dedicated matching mechanism will be established – and if so, who will govern it.

Subsequent decisions (*i.e.* post-Copenhagen) could then focus on how such a mechanism could work. These decisions could include the potentially contentious issue of how to prioritise disbursement. Lessons could be drawn from the past experiences, both in the climate field, as well as in non-climate areas, with disbursing limited resources when the demand surpasses available resources, particularly on how to identify the most important funding gaps and establish institutional arrangements to allow strategic disbursement. Further on, methodological, procedural and/or institutional guidance will be needed on how to make disbursement decisions. These would also need to be stipulated post-Copenhagen in order to achieve an effective matching of support with mitigation actions.

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<sup>60</sup> For instance, this option proposes: 1) an efficient and effective use of current institutions, including the GEF, LDCF, SCCF, multilateral development banks, specialised UN institutions and other existing funds; and 2) an establishment of a Facilitative Platform under the authority and guidance of the COP. The platform will establish 1) a register of actions on mitigation, adaptation, and capacity building strategies and activities; 2) finance, technical and capacity-building support; 3) monitor and analyse information in the register and report it to COP on a regular basis. See Annex X to the UNFCCC (2009f) for more details.

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## Glossary

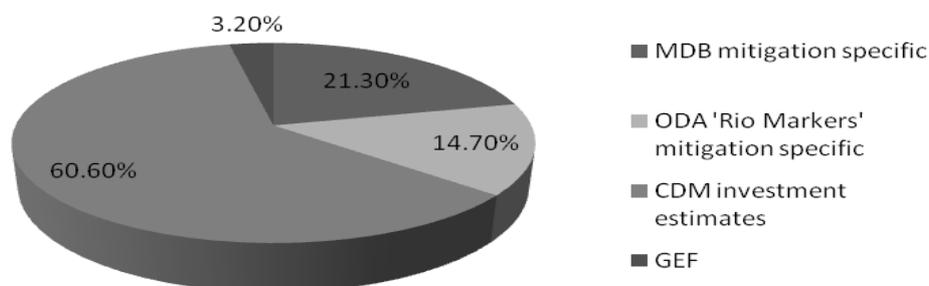
ADB	Asian Development Bank
AfDB	African Development Bank (AfDB)
AIXG	Annex I Expert Group
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CEPIA	Country Environmental Policy and Institutional Assessment Index
CER	Certified Emission Reductions
CFL	Compact Fluorescent Lamps
CIF	Climate Investment Fund
COP	Conference of Parties (to the UNFCCC)
CRS	Creditor Reporting System
CTF	Clean Technology Fund (under the World Bank)
DAC-CRS	(OECD) Development Assistance Committee's Creditor Reporting System
DEFRA	UK Department for Environment, Food and Rural Affairs
EQUIP	Environmental Quality Incentives Programme
EBRD	European Bank for Reconstruction and Development
EIT	Economies in Transition
EU	European Union
FIP	Forest Investment Programme
FCPF	Forest Carbon Partnership Facility
IADB	Inter-American Development Bank
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IFCI	International Forest Carbon Initiative
IPCC	Intergovernmental Panel on Climate Change
CEA	Cost-Effectiveness Analysis
CIF	Climate Investment Fund
CPIA	Country Policy and Institutional Assessment
GBIcc	Global Benefits Index for climate change
GEF	Global Environment Facility
GHG	Greenhouse Gas
GNI	Gross National Income
GPI	GEF Performance Index
JI	Joint Implementation
LDCs	Least Developed Countries
LDCF	Least Developed Countries Fund
LEDS	Low-Emission Development Strategy
LULUCF	Land Use, Land-Use Change and Forestry
MCA	Multiple Criteria Analysis
MDBs	Multilateral Development Banks
MDG	Millennium Development Goals
MRV	Measurable, Reportable and Verifiable (under the Bali Action Plan)

NAMAs	Nationally Appropriate Mitigation Actions
ODA	Official Development Assistance
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
OECD-DAC	OECD Development Assistance Committee
OP5	Operation Program-5 of GEF
PIR	Project Implementation Reports
PPCR	Pilot Programme for Climate Resilience
PPI	Project Portfolio Index
RAF	Resource Allocation Framework
R&D	Research and Development
REDD	Reducing Emissions from Deforestation and Forest Degradation
SBI	Subsidiary Body for Implementation
SD-PAMs	Sustainable Development Policies and Measures
SREP	Scaling-up Renewable Energy programme for Low Income countries (under the
STAP	Scientific and Technical Advisory Panel (under GEF)
STAR	System for Transparent Allocation of Resources (under GEF)
TER	Terminal Evaluation Reports
TGF	The Global Fund (to fight Aids, Tuberculosis and Malaria)
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development

## ANNEX I: Overview of the financial flows for climate change-specific mitigation<sup>61</sup>

The following figure provides financial flows for climate change-specific mitigation actions in developing countries in 2007:

Figure 3: Financial flows for climate change-specific mitigation actions in developing countries in 2007: total est. 19 billion USD (within a range of 8-53 billion)



Source: Extracted from Corfee-Morlot et al. (2009)

Note: The estimate used here is the lower bound for estimates that include private investment through the CDM. The CDM estimate used here is “11 billion USD in 2007 based on the “projects registered. Approach; another approach is to estimate investment associated with projects entering the pipeline in 2007 which would represent about 45 billion USD. These estimates are based on Seres and Haites (2008) as cited in Corfee-Morlot *et al.* (2009).

### MDB Climate Change Funds:

According to the World Bank’s estimates, mitigation-specific investment by the Multilateral Development Banks (MDBs) - World Bank, African Development Bank (AfDB), European Bank for Reconstruction and Development (EBRD), Asian Development Bank (ADB) and Inter-American Development Bank (IADB) has risen significantly in recent years. On average commitments to clean energy and energy efficiency alone in developing countries has reached USD 4.1 Billion annually for the years 2006-2007, and increased 85% from an annual average of USD 2.6 billion between 2000 and 2005.

Source: World Bank, 2006. *Clean Energy and development: towards an investment framework*, DC2006-0002. Available at:

[http://siteresources.worldbank.org/DEVCOMMINT/Documentation/20890696/DC2006-0002\(E\)-CleanEnergy.pdf](http://siteresources.worldbank.org/DEVCOMMINT/Documentation/20890696/DC2006-0002(E)-CleanEnergy.pdf)

### ODA Rio Markers:

Official development assistance (ODA) is monitored by the OECD Development Assistance Committee’s<sup>62</sup> Creditor Reporting System (DAC-CRS). The Rio Marker data for 2005-2007 shows that on average, bilateral ODA related to climate change mitigation amounted to about USD 4 billion annually.

Source: OECD DAC-CRS database, 2009. Available at:<http://stats.oecd.org/Index.aspx?DatasetCode=CRSNEW>

<sup>61</sup> Information contained in this annex was extracted from Corfee-Morlot *et al.* (2009).

<sup>62</sup> The OECD Development Assistance Committee comprises 23 members including the European Commission.

**Clean Development Mechanism:**

The overall size of the CDM market is not a good indicator of the North-South financial flow generated by CDM projects. This is partly because total investments in the underlying CDM projects are not routinely assessed, and also because these investments may be made by entities in the CDM host country. Further, the Certified Emission Reductions (CERs) generated by CDM and sold in a market can be subsequently transacted on the secondary market but these transactions do not represent a new investment in a CDM project. A recent estimate of the size of the CDM market (WB 2009b) puts the value of transactions at almost 33 billion USD in 2008. However, about 80 per cent of the total value represents secondary trading of CERs; only the primary sales of 6.5 billion USD could be considered to represent a North-South financial flow.<sup>63</sup>

Sources: World Bank, 2009b. State and Trends of the Carbon Market 2009. Available at [http://wbcarbonfinance.org/docs/State\\_\\_\\_Trends\\_of\\_the\\_Carbon\\_Market\\_2009-FINAL\\_26\\_May09.pdf](http://wbcarbonfinance.org/docs/State___Trends_of_the_Carbon_Market_2009-FINAL_26_May09.pdf)

**GEF Climate Change Fund:**

The Global Environmental Facility (GEF) is the operational entity of the financial mechanism of the UNFCCC. From 1991-2008, the GEF has allocated a total of just over USD 2.4 billion from its trust fund to the climate change focal areas. GEF funding for climate change projects averaged about USD 163 million per year between 2003 and 2006, with this amount increasing by about 33% over the previous four year period. GEF funds are also estimated to have leveraged seven times more investment through co-financing.

Source: GEF project base database, 2009. Available at <http://gefonline.org/>

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<sup>63</sup> These estimates are made using the capital cost (per thousand tons of CO<sub>2</sub>e) of annual estimated emission reduction for project types using data from 250 projects and from the World Bank.

## ANNEX II: Comparison of Eligibility Criteria for Climate Change Specific Funds

Name of funds	Administered by	Area of focus	Eligibility & Priority		
			Country	Project	
Climate Investment Fund (CIF)	Clean Technology Fund (part of CIF)	WB	Mitigati on-general	<ul style="list-style-type: none"> <li>• Active MDB programme in the relevant sector; a lending programme and/or on-going policy dialogue with the country</li> <li>• ODA eligibility criteria</li> <li>• Readiness/implementation capacity (development of investment plans)</li> <li>• Existence of integrated plan</li> </ul>	<ul style="list-style-type: none"> <li>• Developed pursuant to investment plan</li> <li>• Mitigation potential for long-term GHG emissions savings</li> <li>• Demonstration potential at scale</li> <li>• Development impact</li> <li>• Implementation potential</li> </ul> <p>Additional costs and risk premiums</p>
	Strategic Climate Fund (SCF) <sup>64</sup>	WB	Mitigati on-general		<ul style="list-style-type: none"> <li>• Transformational nature: project's potential to result in market transformation</li> </ul>
	Pilot Programme for Climate Resilience (PPCR) (part of SCF) <sup>65</sup>	WB	Adaptati on-general	<ul style="list-style-type: none"> <li>• High vulnerable LDS eligible for MDB concessional funds, including SIDS</li> <li>• Active MDB programme in the relevant sector; a lending programme and/or on-going policy dialogue with the country</li> <li>• ODA eligibility criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Transformational change (pilot projects)</li> <li>• Climate resilient development plans, following joint exercise in the country involving UN offices, MDBs and other stakeholders</li> <li>• Build on NAPAs and complement existing funding</li> <li>• Outcome of comprehensive planning process and</li> </ul>

<sup>64</sup> This fund does not have eligibility criteria for projects; these are determined according to the programmes set-up under the fund, such as the SREP and CTF.

<sup>65</sup> This is a sort of a precedent for a mitigation fund.

			<ul style="list-style-type: none"> <li>• Readiness/implementation capacity (country investment strategy)</li> <li>• Consistency with national development strategies &amp; priorities</li> <li>• Integrating climate resilience in national development planning/consistency with poverty reduction and sustainable development goals</li> <li>• Vulnerability criteria</li> <li>• Regional distribution and types of hazards</li> </ul>	consistent with development and poverty reduction goals
Scaling-up renewable energy programme for low income countries (SREP) (part of SCF)	WB	Mitigati on-general	<ul style="list-style-type: none"> <li>• Low-income country eligible for MDG concessional funds (priority to Sub-Saharan Africa)</li> <li>• Active MDB programme in the relevant sector; a lending programme and/or on-going policy dialogue with the country</li> <li>• ODA eligibility criteria</li> <li>• Renewable energy resources potential</li> <li>• Implementation capacity (business-friendly environment)</li> <li>• Readiness (Existence of, or willingness to adopt, a programme for renewable energy development)</li> <li>• Regional balance and balance among development contexts (urban/rural population, industrialisation, renewable energy development etc.)</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Investments that create “value added” in local economies</li> <li>• Transformative impact (removing barriers, increasing installed capacity, replication)</li> <li>• Generation of economic, social, environmental benefits</li> <li>• Economic and financial viability</li> <li>• Leveraging of additional resources</li> <li>• Implementation capacity</li> <li>• Investments of sufficient size to sustain system of operations and maintenance</li> </ul>

	Forest Investment Program (FIP) (part of SCF)	WB	Mitigati on-REDD	<ul style="list-style-type: none"> <li>• Active MDB programme in the relevant sector; a lending programme and/or on-going policy dialogue with the country</li> <li>• ODA eligibility criteria</li> <li>• Readiness and implementation capacity (efforts to date and willingness, institutional capacity)</li> <li>• Country distribution across regions and biomes in the context of desired output (deforestation curb, carbon stocks etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Potential to contribute to FIP objectives/purposes and adherence to the principles</li> <li>• Consistency with and/or complement national sustainable development plans</li> <li>• Replicability</li> <li>• Mitigation potential</li> <li>• Prioritisation based on the criteria for investment strategies/programs/projects with a view to maximise the <i>'transformational impact through a few programs'</i> over limited impact in many programs</li> <li>• Address key drivers of deforestation and forest degradation</li> <li>• Inclusive processes and participation of all important stakeholders, (indigenous people/local community)</li> <li>• Demonstration impact</li> <li>• Forest governance criteria and indicators in design and performance assessment</li> <li>• High conservation value forests (<i>e.g.</i> primary forests)</li> <li>• Safeguarding the integrity of natural forest</li> <li>• Partnership with private sector</li> <li>• Economic and financial viability</li> <li>• Capacity building</li> </ul>
Forest	Carbon Partnership	WB	Mitigati on-	<ul style="list-style-type: none"> <li>• All borrowing member countries of the IBRD/IDA</li> </ul>	

Facility (FCPF)		REDD	<p>located in subtropical/tropical areas</p> <ul style="list-style-type: none"> <li>• Substantial forest area and carbon stocks that are important for the livelihoods of forest dwellers and indigenous people</li> <li>• Quality of readiness</li> </ul>	
UN-REDD Programme <sup>66</sup>	UNDP	Mitigation-REDD	<ul style="list-style-type: none"> <li>• Collaborating with UN partners in related areas</li> <li>• Mitigation potential</li> <li>• Countries work towards developing National Readiness Plans and REDD readiness</li> </ul>	<p>National UN Joint Programmes (NJPs) evaluated based on:</p> <ul style="list-style-type: none"> <li>• Ownership by government and non-government stakeholders; level of consultation and participation</li> <li>• Coherence with country strategies and other initiatives</li> <li>• Programme effectiveness and cost-efficiency</li> <li>• Management of risks and likelihood of success</li> <li>• Consistency with UN-REDD Framework Document and operational guidance</li> </ul>
GEF Trust Fund-Climate Change focal area	GEF	Adaptation/Mitigation-general	<ul style="list-style-type: none"> <li>• Countries signed and ratified UNFCCC convention<sup>67</sup></li> <li>• Mitigation potential &amp; implementation capacity (through RAF and STAR based on GBI and GPI)</li> </ul>	<ul style="list-style-type: none"> <li>• Align with one or more of GEF's long-term objectives and strategic programmes</li> <li>• Consistent with national/regional plans, policies or priorities; endorsed by government</li> <li>• Likelihood that project will deliver outcomes and</li> </ul>

<sup>66</sup> Nine pilot countries selected in three regions (Africa, Asia & Pacific, Latin America & Caribbean)

<sup>67</sup> Also those who have signed and ratified the Convention on Biological Diversity (CBD), Convention on Persistent Organic Pollutants (POPs) and UN Convention to Combat for Desertification (UNCCD).

				<p>global environmental benefits</p> <ul style="list-style-type: none"> <li>• Guidance for prioritisation provided by COP</li> <li>• Inventories and National Communications</li> <li>• Projects identified in National Communications</li> <li>• Other obligations under Article 12.1 and 4.1, with emphasis on enabling activities</li> </ul>
MDG Achievement Fund-environment and Climate Change Thematic window	UNDP	Adaptation/Mitigation-general	<ul style="list-style-type: none"> <li>• 57 eligible countries as identified in the Spanish Master Plan for International Cooperation<sup>68</sup></li> <li>• Significant and measurable impact on achieving specific MDGs</li> <li>• Country “Concept Note” submitted by UN resident Coordinator</li> <li>• Country project submissions, Joint Programme Documents, with UN Country Teams<sup>69</sup></li> </ul>	<ul style="list-style-type: none"> <li>• In-line with Fund’s four priority areas<sup>70</sup></li> <li>• Aligned with national strategies and priorities; result in capacity building (at least 1 year)</li> <li>• Identify key indicators to measure and monitor success</li> <li>• Impact, sustainability and “scalability”</li> <li>• Quality of monitoring and evaluation framework</li> </ul>
Adaptation Fund	UNFCCC	Adaptation	<ul style="list-style-type: none"> <li>• (Guidance on eligibility criteria has yet to be fully developed)</li> <li>• Developing country Parties to the Kyoto Protocol</li> <li>• Countries that are particularly vulnerable to the adverse effects of climate change (including LDCs,</li> </ul>	

<sup>68</sup> Of these, 15 are LDCs.

<sup>69</sup> Out of 57 eligible countries, 51 submitted project proposals jointly with UN teams, 18 were considered suitable for support, and 16 have been approved.

<sup>70</sup> Enhancing capacity to adapt to climate change; Expanding access to environmental finance; Improving local management of environmental resources and service delivery; Mainstreaming environmental issues in national and sub-national policy, planning and investment frameworks.

			SIDS or other low-/ middle- income country)	
Least-Developed Countries Fund	GEF	Adaptation	<ul style="list-style-type: none"> <li>• LDC Party to the UNFCCC that has completed its NAPA</li> </ul>	<ul style="list-style-type: none"> <li>• Country driven-ness: correspond to a priority activity <i>i.e.</i> the country's NAPA</li> <li>• Program and policy conformity</li> <li>• Development and inclusion of a financing plan and an assessment of cost-effectiveness</li> <li>• Institutional coordination and support</li> <li>• Monitoring and evaluation</li> </ul>
Special Climate Change Fund	GEF	Adaptation	<ul style="list-style-type: none"> <li>• All non-Annex I countries with geographical emphasis on the most vulnerable countries in Africa, Asia and the SIDS</li> </ul>	<ul style="list-style-type: none"> <li>• Projects addressing the impacts of climate change on a vulnerable socio-economic sector that is beyond the baseline.</li> </ul>
Strategic Priority on Adaptation	GEF	Adaptation	<ul style="list-style-type: none"> <li>• Vulnerable regions, sectors, geographic areas, ecosystems and communicates based on NC and NAPA</li> </ul>	<ul style="list-style-type: none"> <li>• Generating global environmental benefits in the GEF's focal areas as defined by these GEF focal areas</li> </ul>
Cool earth partnership	Japan	Mitigation-Clean technology/Adaptation		<ul style="list-style-type: none"> <li>• Bilateral policy consultation with Japan</li> </ul>
Environmental Transformation Fund (ETF) <sup>71</sup>	UK	General climate change/poverty eradication	<ul style="list-style-type: none"> <li>• Following the criteria/prioritisation of individual funds</li> </ul>	
International Forest Carbon Initiative	Australia	Mitigation-	<ul style="list-style-type: none"> <li>• Selected developing countries (particularly in South East Asia and the Pacific Regions)</li> </ul>	

<sup>71</sup> This fund provides funding to other multilateral funds (CIF, CTF, and FCPF) and follows the eligibility and prioritisation criteria of individual funds.

		REDD		
International Climate Initiative	Germany	Adaptation-mitigation general	<ul style="list-style-type: none"> <li>• Countries with a high reduction potential</li> </ul>	<ul style="list-style-type: none"> <li>• Innovative projects</li> <li>• Projects targeting carbon sinks with high levels of biodiversity</li> </ul>
Global Climate Change Alliance (GCCA)	European Commission	Mitigation/Adaptation	<ul style="list-style-type: none"> <li>• Focus on LDCs/SIDS</li> <li>• National/sectoral CC policies/intention to have them to ensure the integration of cc into development strategies, plans, budgets</li> <li>• Policy dialogue/cooperation on cc with EU</li> <li>• Countries already received budget support through EC or other donors</li> <li>• Preferably EC delegation with sufficient capacity</li> <li>• Ideally active involvement in the cc negotiation</li> </ul>	

Source: adopted from climate funds update by authors.

## ANNEX III: Estimated economic potentials for GHG mitigation at a sectoral level in 2030 for different cost categories (IPCC, 2007)

Sector	Mitigation option <sup>a)</sup>	Region	Economic potential <100 US\$/tCO <sub>2</sub> -eq <sup>c)</sup>		Economic potential in different cost categories <sup>d), e)</sup>			
			Cost cat. US\$/tCO <sub>2</sub> -eq		<0	0-20	20-50	50-100
			Cost cat. US\$/tC-eq		<0	0-73	73-183	183-367
			Low	High	Gt CO <sub>2</sub> -eq			
Energy supply <sup>a)</sup> (see also 4.4)	All options in energy supply excl. electricity savings in other sectors	OECD	0.90	1.7	0.9		0.50	0
		EIT	0.20	0.25	0.15		0.06	0
		Non-OECD/EIT	1.3	2.7	0.60		0.90	0.35
		Global	2.4	4.7	1.9		1.4	0.35
Transport <sup>b), e), g)</sup> (see also 5.6)	Total	OECD	0.50	0.55	0.25	0.25	0	0
		EIT	0.05	0.05	0.03	0	0	0.02
		Non-OECD/EIT	0.15	0.15	0.10	0.03	0.02	0
		Global <sup>h)</sup>	1.6	2.5	0.35	1.4	0.15	0.15
Buildings (see also 6.4) <sup>f), h)</sup>	Electricity savings	OECD	0.8	1.0	0.95	0.00	0	
		EIT	0.2	0.3	0.25	0	0	
		Non-OECD/EIT	2.0	2.5	2.1	0.05	0.05	
	Fuel savings	OECD	1.0	1.3	0.85	0.15	0.15	
		EIT	0.6	0.8	0.2	0.15	0.35	
		Non-OECD/EIT	0.7	0.8	0.65	0.10	0.01	
	Total	OECD	1.8	2.3	1.8	0.15	0.15	
		EIT	0.9	1.1	0.45	0.15	0.35	
		Non-OECD/EIT	2.7	3.3	2.7	0.15	0.10	
Global		5.4	6.7	5.0	0.50	0.60		
Industry (see also 7.5)	Electricity savings	OECD	0.30		0.07		0.07	0.15
		EIT	0.06		0.02		0.02	0.040
		Non-OECD/EIT	0.45		0.10		0.10	0.25
	Other savings, including non-CO <sub>2</sub> GHG	OECD	0.35	0.90	0.30		0.25	0.05
		EIT	0.20	0.45	0.08		0.25	0.02
		Non-OECD/EIT	1.2	3.3	0.50		1.7	0.08
Total	OECD	0.60	1.2	0.35		0.35	0.20	
	EIT	0.25	0.55	0.10		0.25	0.06	
	Non-OECD/EIT	1.6	3.8	0.60		1.8	0.30	
	Global	2.5	5.5	1.1		2.4	0.55	
Agriculture (see also 8.4)	All options	OECD	0.45	1.3	0.30		0.20	0.30
		EIT	0.25	0.65	0.15		0.10	0.15
		Non-OECD/EIT	1.6	4.5	1.1		0.75	1.2
		Global	2.3	6.4	1.6		1.1	1.7
Forestry (see also 9.4)	All options	OECD	0.40	1.0	0.01	0.25	0.30	0.25
		EIT	0.09	0.20	0	0.05	0.05	0.05
		Non-OECD/EIT	0.75	3.0	0.15	0.90	0.55	0.35
		Global	1.3	4.2	0.15	1.1	0.90	0.65
Waste (see also 10.4)	All options	OECD	0.10	0.20	0.10	0.06	0.00	0.00
		EIT	0.10	0.10	0.05	0.05	0.00	0.00
		Non-OECD/EIT	0.20	0.70	0.25	0.07	0.10	0.04
		Global	0.40	1.0	0.40	0.18	0.10	0.04
All sectors <sup>i)</sup>	All options	OECD	4.9	7.4	2.2	2.1	1.3	1.1
		EIT	1.8	2.8	0.55	0.65	0.50	1.0
		Non-OECD/EIT	8.3	16.8	3.3	3.6	4.1	2.4
		Global	15.8	31.1	6.1	7.4	6.0	4.5

## Notes:

- a) Several reduction options are not included due to limited literature sources. This underestimation could be about 10–15%; see below.
- b) For transport, the regional data by cost category do not add up to the global potential: regional (cost) distribution is available for LDV only. Due to the lack of international agreement about the regional allocation of aviation emissions, only global cost distributions are available for aviation. A lack of data means that only global figures are presented for biofuels, and not cost distribution.
- c) The ranges indicated by the potential are derived differently for each chapter. See underlying chapters for more information.
- d) The economic potential figures per cost category are mid-range numbers.
- e) The mitigation potential for the use of biomass is allocated to the transport and power sector. See the discussion on biomass energy in 11.3.1.4.
- f) For the buildings sector the literature mainly focuses on low-cost mitigation options, and the potential in high-cost categories may be underestimated. The zero may represent an underestimation of the emissions.
- g) The '0' means zero, 0.00 means a value below 5 Mton.
- h) The electricity savings in the end-use sectors Buildings and Industry are the high estimates. The electricity savings would be significantly lower if the order of measurement were to be reversed; the substitution potential in the energy sector would have been assessed before electricity savings (see Appendix 11.1).
- i) The tourism sector is included in the buildings and the transport sector.

The Table shows that industry, agriculture and buildings rank in the top three for both the low-range and high-range economic potential estimates, while the waste sector appears to have the lowest economic potential.

## ANNEX IV: Payment and bidding rules of inverse auction

Payments for winning bidders can be based on their own bids (discriminative-price auction) or on a rejected bid (uniform-price auction, which often uses the lowest rejected bid to set the price) (Ferraro, 2007). In the case of discriminative-price auction, bidders gain no surplus if they submit an offer equal to their opportunity cost. Thus they have an incentive to inflate their offer. Hence there is a trade off for bidders between gaining from winning with an inflated offer and risking of losing the support to a competitor or winning the fund resources but not with an inflated offer. In uniform-price auction, bidders have no such trade off as inflating their offers not only server to decrease the probability of acceptance, but also does not change the price received. Payment rules have implications for expenditures for funds. For instance, expenditures can be lower with the discriminative-price auctions when bidders are risk-averse (Riley and Samuelson, 1981). A number of empirical studies also show that discriminative auctions are less costly than uniform-price auctions (McKee and Berrens, 2001; and Cason and Gangadharan, 2005).

In terms of bidding rules, bidders can only bid once (simultaneous auction) or more than one time (sequential auction). In a bidding that allows bid revisions, empirical as well as modelling based studies show that the discriminative-price auction is more expensive than a uniform-price auctions (Cummings *et al.*, 2004; Hailu and Thoyer, 2005). Bidders can also obtain the price information of others' bids (open bid), or they don't know what other bidders are choosing (sealed bid). While open bid helps bidders estimate appropriate offers, it is more susceptible to collusion than sealed bid (Ferraro, 2007).

The existing empirical studies show that auction outcomes vary depending on the bidding rules and the characteristics of bidders. Other external factors could also affect the participants' bidding behaviour. For instance, if a number of competing funds are available, participants may be unwilling to place bids that would result in a lower payment than they would receive through other funds. In this regard, coordination of multiple funds deserves serious consideration.