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FINANCING MITIGATION AND ADAPTATION: WHERE SHOULD THE FUNDS COME FROM AND HOW SHOULD THEY BE DELIVERED?

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Executive Summary

The additional funding for mitigation and adaptation will most likely come from private investments on the condition that domestic policies and policies succeed in shifting investment flows. A robust global carbon price signal is a necessary condition but not sufficient, however. Sufficient conditions include efficient and liquid global capital markets and a progressive reduction in barriers to capital flow. Domestic policies and measures for shifting investment patterns require supporting tools for international cooperation. In climate change policy, international cooperation provides countries with high abatement costs the option of low-abatement costs to reduce emissions abroad. Such options include the use of flexible mechanisms, the Green Investment Scheme and the possible use of post-2012 mechanisms currently under discussion, including Sectoral No-Lose targets and crediting for avoided deforestation. A multilateral fund has been playing a prominent role in catalysing financial investments and flows during the Kyoto Protocol commitment period. Several policy options for raising additional revenues have been tabled: auctioning in a cap-and-trade scheme, proceeds from credit transactions, a levy on aviation, Tobin tax, progressive global tax, debt for efficiency and donated special drawing rights. These options, however, are not sufficiently reliable for the predictable, stable or timely delivery of revenues expected from developing countries, especially those with a low capacity to raise their own revenues for the implementation of policies and mitigation or adaptation measures. Hence, grants, loans, and other instruments provided by international financial institutions should remain the principal source for such countries. Carbon market instruments, which are rapidly emerging and being elaborated, will help to scale up the overall investments and flows and benefits of all market participants. Caution is required in considering the specific policy context of climate change when we consider the possibilities for developing financial facilities and instruments. Some policy options are inherently tied to an agreement on commitments in a post-2012 agreement. For example pure recycling revenues from auctioning will not be politically acceptable. A future finance model is expected to moderate disparity in capacities among the parties, including asymmetry in the allocation of financial flows and investments. A pragmatic approach would be to let markets work and maintain the dynamics of private investments and public-private partnerships while correcting distortion to the markets through concerted efforts to increase financial transfer to under-financed countries, especially LDCs. The proposals point to several key features of a future finance model and trigger a series of questions for further discussion. The most interesting questions centre on the link between the base of revenues and the polluter pays principle (PPP); whether to earmark; the form and modality of a future fund and how to ensure the predictability, stability and timeliness of funding.

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1. Introduction

The provision of financial resources is an integral part of the overall UN framework for climate change. In the UN Framework Convention on Climate Change (UNFCCC) Article 4.3 (commitments) makes it clear that developed country Parties pledged to provide financial resources to pay for the costs incurred by developing country Parties.[1] Article 11 (financial mechanism) sets out the definition, governance or modality arrangements of this pledge.[2] In the Kyoto Protocol Article 11.2 reiterates developed countries' commitments. Developing country Parties claim that developed country Parties have not made sufficient resources available, given the magnitude of the challenge they are facing, which can be addressed as the challenge of 'filling the financial gap' (see Behrens, 2008a). More controversial would be the lack of attention to the principle stated in Article 4.3 of the Convention:

> the implementation of these commitments shall take into account *the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among the developed country Parties* (emphasis added by the authors).

It is not only the quantity but also the quality of financial resources that lead developing country Parties to question the progress of commitments made by developed country Parties.

In the Bali Action Plan, the Parties (COP) to UNFCCC launched a comprehensive new process to enable the full, effective and sustainable implementation of the convention through long-term cooperative action for now, up to and beyond 2012. In this process the Ad Hoc Working Group on Long-term Cooperative Action (AWG-LCA) has a mandate to set out the steps needed to reach the envisaged international agreement at the COP15 in Copenhagen at the end of 2009. One of the building blocks for the agreement is enhanced action on the provision of financial resources and investment. More than a dozen proposals for a future finance model have been

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[1] Article 4.3, UNFCCC, states: "the developed country Parties and other developed Parties included in Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations such as submission of national communications," (Article 12.1). "They shall also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of implementing measures" as required by the general commitments (Article 4.1) and "that are agreed between a developing country Party and the international entity or entities referred to in the Financial Mechanism" (Article 11).

[2] Article 11, UNFCCC, addresses the definition of a financial mechanism, representation and governance, modality and other arrangements, and availability of financial resources related to the implementation of the Convention through bilateral, regional and other multilateral channels.

submitted by Parties including representatives of regional groups (e.g. EU, G77 and China, AOSIS) for discussion at the UN negotiations in Accra, Ghana in August.

Given the time constraint, such solutions should become operational and functional within a reasonable time-frame, once such an agreement is reached in Copenhagen. This condition leads to a pragmatic approach that attempts to introduce both domestic policies and tools for international climate cooperation aimed at shifting investment patterns on the one hand, and to explore innovative tools for raising additional revenues on the other.

This paper is structured as follows: Section 2 discusses the need to shift investment patterns and identifies possible instruments to assist this process. Section 3 deals with potential instruments for raising revenues and Sections 4 and 5 examine existing and new funding instruments and disbursement, respectively. Section 6 describes recent proposals for a new finance model before the concluding Section 7 lists a number of questions for discussion.

2. The need to shift investment flows

Behrens (2008a) indicates in his analysis that the majority of finance will be expected from private capital, provided that policies or measures succeed in shifting investment flows. Such shifts will occur if carbon is priced domestically and globally. This will be enhanced to the extent that global capital markets are efficient and liquid and that barriers to the free flow of capital gradually come down. In the absence of a global carbon signal that is sufficiently robust and in light of existing barriers to capital flow, it is worth exploring what policies and measures could facilitate a shift in investment flows.

2.1 Policies and measures

Without a global carbon signal, the shifting of investment patterns onto a lower carbon trajectory will largely depend on regional, national or even local policies. A number of Parties to the UN Treaty carry out climate change policies. The proposed EU climate and energy package is but one example. Diverse measures such as the development of emissions trading schemes, support for renewables and emissions regulations, are undertaken to shift investment patterns onto a more sustainable path. Probably one of the most effective measures in the short term is to withdraw fossil fuel subsidies or subsidies to products and services that harm the climate. Another way is to remove barriers to trade or investments (e.g. standards, building codes, energy efficiency or zoning codes) in low-carbon products and services. Such measures could lead to not only saving specific costs but also to a better overall allocation of resources through change in consumer behaviour.

2.2 Tools to assist the shift of investment patterns

Governments individually, jointly or multilaterally carry out measures to support such a shift in investment patterns. This includes first of all the Kyoto Protocol flexible mechanisms, future CDM, Green Investment Schemes (GIS), and possible new ‘post-2012 mechanisms’ such as Sectoral No-lose Targets and crediting for avoided deforestation.

2.2.1 The Kyoto Protocol’s flexible mechanisms and the future CDM market

The CDM has become an important tool for emissions reductions in developing countries. In May 2008, there were 3498 CDM projects under validation and registration in the CDM project pipeline. In 2007, 551 million tonnes of carbon dioxide equivalent to 7426 million $US were managed under the CDM. The current project pipeline has the capacity to reduce 2500 million tonnes of carbon dioxide equivalent and the CDM may have generated around 1000 millions of Certified Emission Reductions (CERs) by 2012. The average price of a CER was between €10

(upfront payment) and €17 (paid on delivery). Most authors anticipate some form of CDM to remain part of a future regime. ECN estimates the annual volume of the CDM under current rules to be at 450 million tonnes annually for the 2013-2020 period, around the same level as today (Bakker et al., 2007). If eligibility criteria were to be expanded (excluding avoided deforestation), this figure could go up to 3.2 billion tonnes of CO_2e for the same period (at a price of €20/tCO_2e). This would amount to approximately €64 billion. If we assume that the CDM can leverage investment four times the CERs traded, the overall leveraged investment would be around €240 billion.

Despite this relative success in terms of market indicators, the distribution of CDM projects is contested, in particular based on the observation that it is unevenly spread across the globe. Three countries (China, India and Brazil) account for two thirds of the projects and as regions, Latin America and the Asia and Pacific region host 96% of the projects. Africa was bypassed earlier in the CDM investments flows, but has now somewhat risen to hold a market share of 5% of transacted volumes of Certified Emission Reductions, even though the number of projects (74) is still rather low (Biermann et al., 2008). In addition there are long-standing issues regarding the efficiency in governance structure centring on the Executive Board. Nevertheless, both the distribution of projects and reforms of the Executive Board are considered to be largely transitional problems and have been addressed in UN negotiations.

2.2.2 The Green Investment Scheme

A number of developed country Parties with expected high abatement costs (e.g. Japan, Spain, Austria) not only built up large reserves of CDM or JI credits but also explored the possibilities for the purchase of AAUs. Given the controversy of the Kyoto Protocol's provision on AAU trade, Japan, Spain, Ireland, Austria and the Netherlands have expressed their interest in linking their purchase of AAUs with real emission reductions via a Green Investment Scheme (GIS) (Capoor & Ambrosi, 2008). A green investment scheme (GIS) would in effect make trade of AAUs conditional upon real emission reductions. It could be agreed in advance that revenues from sales of excess AAUs will be invested into projects that could lead to further emission reductions in the host country. In an early stage, expressions of interest in hosting a GIS largely came from central or eastern European countries that were projected to have a relatively small size of excess AAUs but were considered to have institutional and administrative capacities (e.g. Latvia, Czech Republic, Romania, Hungary and Poland). Japan signed a Memorandum of Understanding with Hungary and the Netherlands did so with Romania. Recently Ukraine, a country with a larger potential to supply AAUs, has improved its institutional and administrative capacities and established procedures for GISs (e.g. Averchenkov, 2008). In future small or middle-sized middle-income countries may take up quantitative commitments to emissions reductions and be assigned AAUs like Annex B Parties under the Kyoto Protocol. They could benefit from setting up a joint multilateral GIS in which excess AAUs will be pooled and jointly managed to save administrative costs. Management of a GIS can be also integrated with existing regional institutions. Nevertheless, the potential of a GIS to raise additional revenues will directly depend on Annex I Parties' willingness to take on AAUs in the post-2012 period, which is highly uncertain.

2.2.3 Sectoral No-Lose Targets (SNLT) and crediting for avoided deforestation

As a variation of CDM and part of the post-2012 agreement, Sectoral No-Lose Targets (SNLT) are proposed (Ward et al. 2008). The advantage of this proposal is that there is no requirement for the measurement of additionality. This is because the quantitative elements of the overall post-2012 agreement would set up a direct link between targets of developed countries and credits to be generated by SNLTs from developing countries. Nonetheless, SNLT still requires an agreement on sectoral baselines as well as measurement and data collection, which would

limit its application to selected sectors. While the Accra talk did not yield progress in work on sectoral approaches, it sent a positive signal to the role of deforestation, which reportedly accounts for about 20% of global GHG emissions in the post-2012 agreement. It is possible that a new market will be created for credits from avoided deforestation. These proposals are subject to the same challenge as the one evolving CDM would face: how to impose stringent commitments on developed countries to match an increase in the supply of credits from developing countries, and how to remove the deep suspicion among developing countries about any notion that would inspire target-setting.

2.2.4 Multi-lateral funds

In addition, developed countries contribute and deliver financial resources to a multilateral fund. Under the UNFCCC, Article 4.3, Annex II Parties pledged to provide financial resources to the implementation of measures by developing countries through UNFCCC financial mechanisms operated by the Global Environment Facility (GEF). Furthermore, a number of special funds have been established: Special Climate Change Fund (SCCF); Least Developed Countries Fund (LDCF); and Adaptation Fund. See also Section 4 on finance instruments.

Developing country Parties have been particularly concerned with the sources of such finance and have worked hard to ensure that funding should be new and additional (e.g. not diverted from existing Official Development Assistance, ODA). While ODA in general accounts for less than 1% of global investment, the least developed countries (LDCs) in particular rely on soft loans from international financial institutions (IFIs) and ODA with a limited share of private investments. Multilateral and bilateral funding is a significant source of investment (about 1 to 7%) in developing countries (UNFCCC).

The largest potential to increase funding is expected from private investments and public-private partnerships, especially through the expansion of carbon markets. As many of the vehicles used in this area are hybrid, see the discussions under the section on instruments in Section 4.

3. Where can additional revenues be raised?

In theory there are two options to deal with financing requirements: to raise additional revenues to meet additional expenses, or to control spending within the given budget. In the context of climate change policy in general and that of post-2012 negotiations in particular, while the latter may contribute to plugging the gap, on its own it is not an option. In the UNFCCC, developed country Parties pledged to make resources available for the implementation of measures by developing country Parties. The former has neither made sufficient progress in work nor paid attention to the need for adequacy or predictability in the flow of funds or the importance of appropriate burden sharing. This leaves us only one route: raising additional revenues.

The goal of raising additional revenues can be achieved through different means. UNFCCC (2007) identified three categories of significant changes to be made in the patterns of investment and financial flows: shifting investments and financial flows made by private and public investors to more sustainable climate-friendly alternatives; scaling up international private and public capital dedicated to investments and financial flows in mitigation or adaptation activities or technologies, and optimising the allocation of the funds available by spreading the risks across private and public investors. Of the three types this paper covers the first two – shifting and scaling up.

Below we address a set of policy options: some are being implemented; others remain conceptual. The following options are listed as examples and are by no means exhaustive. A table appears in the Appendix.

3.1 Revenues from auctioning

The most obvious source of additional public finance is through auctioning in cap-and-trade emissions trading regimes. Expected revenues in the EU from auctioning under the EU ETS will amount to around €55 billion annually for the period 2012 to 2080. And even in a scenario whereby auctioning will apply only to the power sector, there would still be total revenues accruing to member states in the order of €33 billion for the same period. This could even go up to a total of €80 billion annually. Similar schemes are developed in other parts of the world, including the US.

The auctioning of international aviation and shipping allowances has been estimated to generate revenue of $23.6/tCO2, $22 billion in 2010, $28 billion in 2020 and $35 billion in 2030 (UNFCCC, 2007).

As revenue from auctioning in a cap-and-trade scheme depends on the market price and willingness of participants to pay, there is a lack of predictability or stability about the exact amount of revenues. This feature would make it difficult for LDCs to rely on auctioning-based support for budgeting and implementing domestic policies and measures. Hence auctioning would be more suitable as a complement to conventional public finance despite its ability to raise a higher amount of revenue.

3.2 Proceeds of credit transactions

There is already a 2% levy or proceed of the CDM as a revenue source. Even limiting such a levy on the CDM only at this stage could deliver significant returns. The size of the revenues depends both on the volume and the price of CO_2 after 2012. Under current CDM rules, ECN (Bakker et al. 2007) estimates a trade of 450 million of CERs (at a price of €20/tCO2e), which is translated into a total volume of €9 billion. A 2% share of proceeds would amount to €180 million. Using far wider eligibility criteria from the same ECN study (Bakker et al. 2007), the total supply could go up to 3.2 billion t/CO2e (at a price of €20/tCO2e), which would be translated into a total volume of €64 billion. A 2% proceed would amount to around €1.2 billion p.a.

The uneven distribution of CDM projects (2.2.1) and limiting a levy to CDM mean that to their frustration only a handful of host countries, mainly the large developing ones with unilateral projects, currently contribute to the adaptation fund from which some will be then recycled to themselves but others disbursed to developing countries at high risk. One solution would be to share the payment between a host country and credit buyers. Another would be to extend such a levy to JI or AAU trade involving developed countries and credit buyers, like auctioning the volume of and revenue from credit transactions may vary year by year. Unlike cap-and-trade, CDM and JI themselves are likely to give less margin for upfront payment (c.f. loans such as CCFF and CCTAF for developers in Section 4.1). These features would also make a levy on credit transaction as a complement to public finance.

3.3 Levy on aviation

There has been a proposal for a levy on international aviation. The rationale for such a levy is that the sector by definition is international and will therefore need international policy coordination. According to the UNFCCC, International Air Travel Levy could generate $13 billion annually, if set at $6.5 per passenger per flight (Müller & Hepburn, 2006, cited in UNFCCC, 2007). Revenues from auctioning have been covered in the section on auctioning, 3.1.

3.4 New concepts

a) Tobin tax

In the context of the Tobin tax discussion, using the proceeds for climate change has been suggested. It taxes all cross-border trade of currencies, intended to penalise short-term speculation in currencies and therefore to address currency volatility. Originally, the proposed tax rate was set at 1%, subsequently to be lowered to between 0.1%, 0.25% or even below (e.g. Reisen, 2002; Hanke et al., 2007). The possible annual revenue from the Tobin tax has been estimated at 2003 $30-35 billion if set at 0.02% and at 2003 $15-20 billion while, if set at 0.01%, assuming that the tax should be kept low for political and technical reasons (Nissanke, 2003, cited in UNFCCC, 2007).

The likelihood for such a tax is uncertain and the current financial crisis will not make it a priority. It should also be expected that revenues would be rather used for addressing the consequences of the financial crisis rather than climate change.

b) Progressive global tax

Another example is a proposal for progressive global tax (Baer et al., 2007). Introduction of carbon taxes or cap-and-trade will need to be combined with compensating policies due to concerns with higher energy prices and the subsequent impacts on economy (e.g. inflation, balance of payments, fiscal deficit, growth) (Banuri, 2008). Revenues from taxes can be used to soften such impacts.

c) Debt for efficiency

Another experimental approach is the concept of 'debt-for-efficiency' swaps, which was inspired originally by 'debt-for-equity' swaps and, in environmental policy, preceded by 'debt-for-nature' swaps in the 1990s. The concept of 'debt-for-nature' swaps was to link reduction in country-debt with outcomes of nature conservation projects orchestrated by host country governments, IFIs, and environmental NGOs in an early form of public-private partnerships. Similarly 'debt-for-efficiency' is designed as a scheme in which creditors negotiate an agreement that cancels a portion of the non-performing foreign debt outstanding in exchange for a commitment by the debtor government to invest the cancelled amount in clean energy projects domestically (UNFCCC 2007).

d) Donated special drawing rights

A final innovative option for raising additional revenues refers to a fund to invest foreign exchange reserves to donated special drawing rights for climate change activities.

4. What different funding instruments can deliver

This section addresses the generic (or notional) types of instruments that are utilised to fund climate change activities. We have identified three notional types of instruments; i) ODA-type of instrument (i.e. grant and soft loans), ii) other instruments and iii) carbon market instruments. After describing the different instruments, we explain how they work and to which areas they are usually applied, before giving a very rough estimate of the cumulative size of existing mechanisms (funds, facilities etc.) that employ each type of instrument. Please note that in reality, finance facilities often use a mix of instruments (we refer to these as hybrids).

4.1 Grants and loans

Grants represent transfers that can either be made in cash, goods or services (OECD, DAC's Glossary). They do not require repayment by the beneficiary. In the area of climate change, this

is one of the principal tools used in multilateral or bilateral public sector assistance. The contributions, stemming from donor countries' budgets, are disbursed to beneficiaries by mechanisms, such as the GEF, through grants of various sizes. Projects, and increasingly programmes in developing countries aimed at mitigation and adaptation to climate change, benefit from such grants. The typical activities covered include renewable energy, energy efficiency, sustainable transport, low-GHG energy technologies, enabling activities and adaptation,[3] usually combined with other sustainable development and environmental benefits. Land use and forest management practices are also increasingly being addressed, especially by recently created mechanisms (e.g. the GEF Tropical Forest Account TFA).

Apart from the multilateral funds under the financial mechanism of the convention (GEF Trust Fund, Adaptation Fund, SCCF and LDCF), grants are also typically employed by other multilateral and bilateral mechanisms, such as the European Commission's Global Climate Change Alliance (GCCA) (Behrens, 2008b). In rare cases the Multilateral Development Banks (MDBs) also use grants, mostly for technical assistance or project preparation, as in the World Bank's implementing and co-financing operations related to GEF, but especially in the recently announced Climate Investment Funds (CIFs), i.e. the Clean Technology Fund (CTF) and the Strategic Climate Fund (SCF), and in the non-market elements of the Carbon Partnership Facility (CPF) and the Forest Carbon Partnership Facility (FCPF).

Lending is another traditional instrument for financing, usually in the form of concessional (soft) loans. These long-term **loans** usually employ interest rates below market level and/or grace periods (interval to first repayment of capital). Concessionality terms may be determined in additional ways by each multilateral or regional development bank (IMF 2003). The activities covered by such loans, as well as their sources in terms of donor contributions, are usually the same as for the grants above. MDBs and other Multilateral Financial Institutions (MFIs), such as the European Investment Bank (EIB), also employ long-term loans based on favourable but maket interest and terms, the funding for which is obtained by borrowing through low risk bonds on financial markets (World Bank, 2003).

Loans are predominantly used by MDBs, e.g. under the World Bank's principal IBRD/IDA lending instrument (including for renewable energy and energy efficiency projects and the Clean Energy and Development Investment Framework) (World Bank).[4] The EIB utilises the Climate Change Financing Facility (CCFF) and the Climate Change Technical Assistance Facility (CCTAF) for upfront lending to developers of Kyoto-based projects. Concessional loans have been to a lesser extent employed by the multilateral and bilateral mechanisms above, as well as by some of the new ones, e.g. GEF-IFC Earth Fund and the World Bank's CIFs.

Due to the fact that grants and (concessional) loans are the primary instruments of international multilateral and bilateral donor funding, they are often referred to as **ODA-type** (Official Development Assistance) (Müller, 2008; Porter et al., 2008). For this reason they could be grouped together and distinguished from the other/new instruments that are being increasingly incorporated in new mechanism designs.

4.2 Other and new instruments

Some of the new grant/loan mechanisms include contributions from private entities, essentially creating public-private partnerships, such as the World Bank CIFs or the GEF-IFC Earth Fund, and to a lesser or significant extent employ additional instruments. Thus, these new instruments

[3] More specifically these are the GEF activities.

[4] World Bank, "Renewable Energy & Energy Efficiency", Energy Topics, World Bank website (http://go.worldbank.org/6XC42PKNI0, retrieved on 22/09/2008).

happen to act as a bridge to attracting private sector involvement in climate financing and are utilised by some carbon funds as well. Here is a list of the instruments with some of the mechanisms to utilise them.

- **Guarantees** and other risk mitigation instruments. Credit guarantees, for example, such as the GEF Partial credit guarantees, are a common credit practice involving the guarantor reimbursing the lender if the borrower fails to repay a loan (Olivier, 2003; IMF, 2003). In the World Bank Group, the Multilateral Investment Guarantee Agency (MIGA) provides guarantees against non-commercial risks, while the International Finance Corporation (IFC)[5] also offers a Carbon Delivery Guarantee for credits from carbon market projects (World Bank;[6] IFC, 2008).
- **Investment** in terms of private **loans and equity** participation is utilised especially by the IFC, particularly in clean energy (IFC, 2008).
    - **Risk capital** or venture capital for start-up enterprises is the type of investment to be provided and leveraged (through sub-funds) by the Global Energy Efficiency and Renewable Energy Fund (GEEREF) proposed by the European Commission.
- **Inducement prizes** are usually awarded for technological innovations with specific goals defined by the awarding body (Committee on the Design of an NSF Innovation Prize, 2008). The GEF-IFC Earth Fund is to utilise these (Porter et al., 2008).
- **Technical assistance** is not a financial transfer itself but is usually tied to one, e.g. under the GEEREF. The EIB provides expertise to help carry out and thus ensure the success of the projects to which the CCTAF lends (EIB, 2007). The IFC provides technical assistance in the climate financing field to financial intermediaries in developing countries, together with investments (IFC, 2008).

4.3 Hybrid mechanisms

The World Bank's recent initiatives combine a donor-type grant/loan element with a carbon fund and several other instruments within the same mechanism without clearly distinguishing the amounts for each instrument (CIFs, CPF, FCPF). The Climate Investment Funds (CIFs) have a targeted capitalisation of $5 billion, which is translated into around $1 billion p.a. for their initial operational period (World Bank, 2008c). The Carbon Partnership Facility ($5 billion), which targets post-Kyoto project credits, includes a Carbon Asset Development Fund (CADF) to prepare emission reduction programmes through long-term investments, but the amount to be used there is unknown and therefore not mentioned here but referred to below (World Bank Carbon Finance Unit (b)).

4.4 Carbon Market Instruments

The **project credits** from Kyoto flexible mechanisms (CDM and JI) bought on the international carbon market represent emission reductions (CERs and ERUs)[7] financed by the transaction and thus constitute a funding instrument themselves. There are also voluntary emission reduction credit types (as opposed to compliance), such as verified emission reductions (VERs), which constitute the voluntary carbon market. Each purchase generates additional private investment in assets, e.g. a renewable power-generating installation. Additional **derivatives and other**

[5] The private sector arm of the World Bank Group.

[6] World Bank, "Portfolio", Energy Topic, World Bank website (http://go.worldbank.org/MOBX6YEMS0 retrieved on 22/09/2008).

[7] Certified Emission Reduction under CDM, Emission Reduction Units under JI.

instruments for hedging risk have been developed, including guaranteed CER (gCER) and other guarantees, thus forming the secondary CDM market transactions.

Carbon procurement vehicles (carbon investment funds) pool private and public capital with the goal of securing emission reduction credits to the contributors. There are three types of such vehicles: carbon funds, project facilities and government procurement programmes.[8] Although countries and other entities may purchase project credits directly, the share of the procurement vehicles is significant and growing, estimated at 24% of all CERs and 31% of all ERUs (Cochran & Leguet, 2007). The most well-known form of carbon procurement vehicles are the carbon funds operated by the World Bank, 11 funds so far (incl. FCPF) with a total capitalisation of around $2 billion (Carr & Rosembuj, 2007). However, the envisaged €5 billion of the new Carbon Partnership Facility (CPF) may represent a significant scaling-up in the future as it includes a carbon fund (World Bank Carbon Finance Unit (b)).

5. Disbursement

There are different types of disbursement. Some levies are designated for specific use while others are not so restricted. There are one-off transactions like the government purchase of AAUs through GIS and tender for CDM or JI credits. There are multilateral funds such as the World Bank Prototype Carbon Fund, which was set up by public and private investors in credit-generating projects. Modes of disbursement could be project-by-project funding, programmatic approaches or core/general budget support (Velaso, 2008). Disbursement considerations include a choice over support for the mainstreaming of adaptation that requires co-financing or support for 'stand-alone adaptation', which requires no co-financing. Access considerations include a choice over direct access to funding by countries or indirect access through international entities, and granting priority access according to vulnerability (Sareen, 2008).

It is also possible to set up regional or national cap-and-trade schemes and to introduce 'revenue recycling' as part of the scheme in which revenues raised from auctioning will be reinvested into the targeted sectors. This could take different forms: for example, most of the resources are collected, pooled, and used up each year; or most of the resources are accumulated in a fund from which a share of the proceeds will be reinvested. For political and administrative reasons pure revenue recycling – a scheme that collects revenues from and pays them into exactly the same sector or country – is unlikely to be supported at the international level, especially in the context of UNFCCC. The basic assumption of the UN framework is a disparity between the capacities of Parties to cope with climate challenge and an asymmetry in the allocation of financial flows and investments among them. A future finance model is expected to moderate such a disparity or asymmetry and make financial flows more equitable and evenly distributed. The concentration of CDM projects in selected host countries up to and during the first commitment period (2008-12) led Parties in Nairobi in 2006 to launch an initiative for promoting such projects in Africa. The equitable and even distribution of resources is essentially an aspirational goal that would create constant tension and a preference for private investors for profitability, cost-effectiveness, and efficiency in resource allocation. The

[8] A carbon fund is an investment vehicle specialising in the financing of emission reduction projects through upfront payments, equity investment or forward purchase contracts (e.g. the European Carbon Fund launched by the Caisse des Dépôts and Fortis Bank). A project facility is specialised in development and active management of emission reduction projects (e.g. Japan Greenhouse Gas Reduction Fund). While these two are open to private investments, government procurement programmes are not open and designed to help Annex B Parties meet the Kyoto Protocol targets. Government procurement programmes can take the form of carbon funds, project facilities, tender and purchasing programmes (e.g. ERUPT New Style) (Cochran & Leguet, 2007).

UNFCCC framework attempts to accommodate these two contrasting forces by establishing financial mechanisms as a vehicle for developed countries to assist developing countries on the one hand, and flexible mechanisms (CDM, JI, AAU trading) on the other as a tool for developed countries to meet their commitments in a cost-effective way. As private sector investments are estimated to account for 86% of future investment and financial flows (UNFCCC, fact sheet), private investments together with public-private partnerships will probably play an even more prominent role in leveraging domestic and international capitals. One pragmatic scenario is to let markets work and maintain the dynamics of private investments and public-private partnerships while correcting distortion to the markets through concerted efforts to increase financial transfer to underfinanced countries, especially LDCs.

6. Recent proposals for a future finance model

What emerges from the set of proposals points to several key features of a future finance model. Developing countries maintain the conventional view that only developed countries should pay into a new financial mechanism based on the polluter pays principle, which would constrain the use of private investments beyond compliance flows or markets. In contrast the Swiss proposal focuses on the net flow of payment into and disbursement from such a body, which allows a degree of flexibility. Developing countries also reiterate that the core of new funding should be new and additional (Article 4.3, UNFCCC), complementary to existing funding (e.g. voluntary contributions, ODA), and based on grant-oriented public finance while developed countries favour public-private partnerships or private investments to leverage domestic or international capital. Developed countries tend to highlight the scale or magnitude of the financial gap and turn to the private sector for raising additional revenues. Developing countries' preference for public finance may be linked to their attention to predictability, stability and timeliness of funding, even though they expect even more to see a drastic increase in the overall level of new funding. Developing countries prefer to place any funds under the authority of UNFCCC, whereas developed countries prefer to leave their management to the World Bank. The following list is neither exhaustive nor comprehensive but serves as an illustration.

- **The G77-and-China group** reiterates that the funding will be ***new and additional***, which is over and above ODA (the Philippines, on behalf of the G-77 and China). The level of the new funding can range from 0.5% to 1% of GNP of Annex I Parties. The group emphasises the importance of the ***predictability, stability and timeliness*** of funding. The major source of funds should thus be **public finance** and essentially **grant-based,** particularly for adaptation. The financial mechanism should be operated under the authority of the **COP**. China suggests the establishment of **specialised funds for specific demands** such as adaptation, mitigation and technology acquisition. The financial mechanism should facilitate linkages between various funding sources and separate funds.
- **The AOSIS group** equally stresses the availability of ***new, additional, adequate and predictable resources in a timely manner*** for the implementation of adaptation planning, projects and activities (Barbados, on behalf of the AOSIS). A Convention Adaptation Fund can be linked to GHG emissions based on the ***polluter pays principle*** with criteria for contributions and the prioritisation of resources. A share of the proceeds from **auctioning** AAUs, as Norway suggests, can be used for this fund.
- **India, a member of the G77,** places equal importance on the above-mentioned principles and calls especially for annual contributions equal to 0.5% of developed country Parties' total GDP in order to 'meet the agreed full incremental costs' (Article 4.3, UNFCCC). In addition **levies on international travel or use of marine haulage** and voluntary grant funding could be also counted in funding sources. The financial architecture should be

organised into **functional windows** (i.e. specific funds) **for specific demands** such as available technologies, emerging technologies, and technology research. Such funds should be placed under a common architecture of governance, funding and investment policies and should be operated under the authority of the **COP**.

- Concerning financing adaptation, **Switzerland** proposes the introduction of **a uniform global levy** of $2 per tCO_2 on all fossil fuel emissions, leading to 0.5 US cents per litre of liquid fuel (i.e. upstream collection). According to the **polluter pays principle** all Parties assume their fair share of responsibility for addressing climate change in accordance with their share of responsibility for the problem. All parties will have to pay, but there are some arrangements for developing country Parties. First, for softening the impacts (cf. Banuri, 2008), free allowance (i.e. tax exemption) of 1.5 tCO_2-eq per capita will be granted. Second, each Party will pay into both a multilateral adaptation fund and national funds at its own ratio. Third, each Party will pay into the multilateral fund and receive funding from the body to spend for implementation of measures, mainly adaptation. Net receipts vary across Parties. It is estimated that the total revenues for funding the multilateral fund will amount to $18.4 billion. The share of industrialised countries' contribution would be 76%.
- **Norway** proposes **auctioning** a share of AAUs of all Parties. A small share of allowances could be auctioned directly or through **a tax** on the issuance of allowances. It is estimated that a 2% auctioning of the allowance, equivalent to the CDM levy, would generate an annual income of between $15 and 25 billion. The amount of allowances to be auctioned could be predetermined by a number of allowances, by a fixed percentage of the total amount or a predetermined revenue requirement. It is also possible to set up a process for deciding the exact amount of allowances at a later stage.
- Lastly, **Mexico**'s approach is to introduce a multilateral agreement on the establishment of **a world fund**. Contributions from each Party will be determined using three simple indicators (GHG emissions, population, and GDP) and based on criteria such as the **polluter pays principle**, equity, efficiency, and payment capacity. It is expected that the fund should mobilise no less than $10 billion per year. Mexico refers to several mechanisms for mobilisation such as **auctioning permits in domestic cap-and-trade schemes** in some developed countries and **air travel tax with less reliance on public finance**. A part of the total contributions could be set aside for LDCs, which might be exempted from making a contribution to the fund. The fund will be operated under the **COP**.

7. Questions for further discussion

1. Should the revenue base be related to GHG emissions to reflect the polluter pays principle? Is there any trade-off between the application of the PPP (i.e. environmental effectiveness) and tapping market potential to raise additional revenues (i.e. ability to pay)?
2. Which are the most promising revenue sources?
3. Is earmarking of auctioning revenues an option? What are the modalities for the determination of allowances to be auctioned?
4. Which policy options can be developed on their own (e.g. GIS, domestic auctioning) and which require an agreement on commitments in the post 2012 agreement (e.g. SNLT)?
5. Integration or coordination with existing or proposed funds?
6. How to ensure predictability, stability and timeliness of funding
7. Should we address governance?

Note that this paper has not addressed governance issues in great depth but aims to raise a number of questions for debate. The UNFCCC states that i) a financial mechanism shall function under the guidance of and be accountable to the COP (Article 11.1); ii) the COP shall decide on the policies, programme priorities and eligibility criteria (Article 11.1); and iii) the financial mechanism shall have 'an equitable and balanced representation of all Parties within a transparent system of governance' (Article 11.2). Key questions include who has authority (e.g. the COP under the UNFCCC, the World Bank or other IFIs, or for example under a foundation such as the Global Fund to fight Aids, Tuberculosis and Malaria), who should be represented on the board, if any (e.g. investors, donors) and who should provide guidance for investments. For example, selection criteria for GIS finance have been developed on bottom-up by individual host countries in cooperation with the World Bank, which may converge at a later stage. Further questions address how such responsibility is to be shared and who is primarily accountable to investors or donors. Institutional frameworks or designs also include a choice over multiple funds for different purposes or one funding mechanism with different windows.

References

Averchenkov, A. (The World Bank) (2008), "Overall overview of GIS instrument, its developments and prospects for the Russian Federation", presented at Moscow Carbon Forum, 28-29 April.

Bakker, S.J.A., A.G. Arvanitakis, T. Bole, E. van de Brug, C.E.M. Doets and A. Gilbert (2007), *Carbon credit supply potential beyond 2012. A bottom-up assessment of mitigation options*, ECN-E--07-090, November.

Banuri, T. (2008), "Carbon taxes, climate change, and sustainable development", presentation prepared for Carbon taxes: A tool for managing climate change or a threat to the world's poor?, New York, 17 June (www.un.org/esa/ffd/events/carbontaxes/Banuripresentation.ppt).

Barbados (on behalf of the AOSIS) (2008), "Preliminary AOSIS views on adaptation under the AWG-LCA", 26 August.

Baer, P., T. Athanasiou and S. Kartha (2007), *The Right to Development in a Carbon Constrained World – The Greenhouse Development Rights Framework*, Publication series on ecology, Volume 1, Heinrich Böll Foundation, Berlin, November.

Behrens, A. (2008a), *Financial Impacts of Climate Change: What Scale of Required Resources?*, ECP Paper No. 6, European Climate Platform, Brussels.

Behrens, A. (2008b), *Financial Impacts of Climate Change: An Overview of Climate Change related Actions in the European Commission's Development Cooperation*, CEPS Working Document No. 305, CEPS, Brussels, September.

Biermann, F. et al. (2008), *Climate Governance Post-2012*, CEPS-ADAM Policy Brief, September.

Capoor, K. and P. Ambrosi (2008), *State and Trends of the Carbon Market 2008*, World Bank, Washington, D.C., May.

Carr and Rosembuj (2007), "World Bank Experiences in Contracting Emission Reductions", *Environmental Liability*, [2007] 2 Env. Liability, LAWTEXT PUBLISHING LIMITED.

China (2008), *China's views on enabling the full, effective and sustained implementation of the Convention through long-term cooperative action now, up to and beyond 2012*, submission by China to the Ad-hoc Working Group on Long-term Cooperative Action under the Convention, the United Nations Framework Convention on Climate Change, 28 September.

Cochran, I.T. and B. Leguet (2007), *Carbon investment funds: The influx of private capital*, Mission Climat, Research Report No. 12, November.

Committee on the Design of an NSF Innovation Prize (2008), *Innovation Inducement Prizes at the National Science Foundation*, the National Academies Press, Washington, D.C. (http://books.nap.edu/openbook.php?record_id=11816&page=9, retrieved on 22/9/2008).

EIB (2007), *Climate Change Mitigation and Adaptation Activities*, Marketing Prospectus (http://www.eib.org/projects/documents/climate-change-mitigation-and-adaptation-activities---marketing-prospectus.htm, retrieved 22/9/2008).

European Commission (2006), *Mobilising public and private finance towards global access to climate-friendly, affordable and secure energy services: The Global Energy Efficiency and Renewable Energy Fund*, Communication from the Commission to the Council and European Parliament, Brussels, 6.10.2006, COM(2006) 583 final, available at http://ec.europa.eu/environment/jrec/energy_fund_en.htm (01/12/2008)

Hanke, M. et al. (2007), *The economic consequences of a Tobin tax: An experimental analysis*, Working Papers in Economics and Statistics, University of Innsbruck, 2007-18.

IFC (2008), *IFC and Climate Change - Unleashing the Power of the Private Sector to Mitigate and Adapt to Climate Change*, brochure (http://www.ifc.org/ifcext/sustainability.nsf/Content/ClimateChange, retrieved on 22/9/2008).

IMF (2003), *External Debt Statistics: Guide for Compilers and Users*, IMF, Washington, D.C.

India (2008), *Government of India submission on financing architecture for meeting financial commitments under the UNFCCC*, submission by India to the Ad-hoc Working Group on Long-term Cooperative Action under the Convention, the United Nations Framework Convention on Climate Change, 17 October.

Mexico (2008), Submission by Mexico to the Ad-hoc Working Group on Long-term Cooperative Action under the Convention, the United Nations Framework Convention on Climate Change, 13 August.

Müller, B. and C. Hepburn (2006), *IATAL: an outline proposal for an International Air Travel Adaptation Levy*, Oxford Institute for Energy Studies.

Müller, B. (2008), *International Adaptation Finance: The Need for an Innovative and Strategic Approach*, Oxford Institute for Energy Studies, EV 42, June.

Nissanke, M. (2003), *Revenue Potential of the Tobin Tax for Development Finance: A Critical* Appraisal, School of Oriental and African Studies, University of London.

Norway (2008), Submission by Norway to the Ad-hoc Working Group on Long-term Cooperative Action under the Convention, the United Nations Framework Convention on Climate Change, 14 August.

OECD, *DAC's Glossary*, Development Co-operation Directorate (DCD-DAC) (http://www.oecd.org/glossary/0,3414,en_2649_33721_1965693_1_1_1_1,00.html, retrieved 23/9/2008).

Olivier, E. (2003), "Mobilizing Private Capital: Guarantees and Contingent / Risk Finance", presentation at the Workshop on Tools for Risk Mitigation in Small-Scale Clean Infrastructure Projects, World Bank Office, Paris, 19-20 November.

The Philippines (on behalf of the G-77 and China) (2008), *Proposal: Financial mechanism for meeting financial commitments under the Convention*, 25 August.

Porter, G., N. Bird, N. Kaur and L. Peskett (2008), *New Finance for Climate Change and the Environment*, WWF, Heinrich Böll Foundation, Washington.

Reisen, H. (2002), "Tobin tax: Could it work?", *OECD Observer*, No. 231/232, May.

Sareen, J.S. (2008), "Financing and technology cooperation for adaptation: Proposed outline of the update", Consultative meeting on the update of technical paper on investment and financial flows, Bonn, 7 August.

Switzerland (2008), "A Swiss proposal for global solidarity in financing adaptation", submission by Switzerland to the Ad-hoc Working Group on Long-term Cooperative Action under the Convention, the United Nations Framework Convention on Climate Change, 3 October.

UNFCCC (2007), *Investment and Financial Flows to Address Climate Change*, UNFCCC, Bonn.

UNFCCC (2008a), submitted to the Ad hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), the second session of AWG-LCA, Bonn, Germany, 2-12 June (http://unfccc.int/meetings/ad_hoc_working_groups/lca/items/4416.php (the second session).

UNFCCC (2008b), submitted to the Ad hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), the third session of the AWG-LCA, Accra, Ghana, 21-27 August.

UNFCCC fact sheet, "Financing climate change: Investment and financial flows for a strengthened response to climate change" (http://unfccc.int/files/press/backgrounders/application/pdf/fact_sheet_financing_climate_change.pdf).

Velaso, Y. (2008), "Financing and technology cooperation for mitigation: Proposed outline of the update", Consultative meeting on the update of technical paper on investment and financial flows, Bonn, 7 August.

Ward, M. et al. (2008), "The role of sector no-lose targets in scaling up finance for climate change mitigation activities in developing countries", prepared for the International Climate Division, Department for Environment, Food and Rural Affairs (DEFRA), UK, May.

World Bank (2003), "Multilateral Development Banks", World Bank – About Us (http://go.worldbank.org/F3REECOMB1, retrieved on 22/9/2008).

World Bank (2008), *Towards Strategic Framework on Climate Change and Development for the World Bank Group*, Concept and Issue Paper, Consultation Draft, 27 March.

World Bank (2008b), "Towards a Strategic Framework on Climate Change and Development for the World Bank Group", presentation by Michele de Nevers, Brussels, 29 May.

World Bank (2008c), "Q & A: Climate Investment Funds" (http://siteresources.worldbank.org/INTCC/Resources/Q&A_CIF_July_1_08.pdf, retrieved on 22/9/2008).

World Bank Carbon Finance Unit (a), (undated) *The Carbon Partnership Facility Booklet* (http://wbcarbonfinance.org/docs/CPF_Booklet.pdf retrieved from http://wbcarbonfinance.org on 01/12/2008).

World Bank Carbon Finance Unit (b), (undated) *About the Carbon Partnership Facility (CPF)* (http://go.worldbank.org/HY7RCWTM70, retrieved on 01/12/2008).

World Bank (2008) "Portfolio", Energy Topic, World Bank website (http://go.worldbank.org/MOBX6YEMS0, retrieved on 22/9/2008).

World Bank (undated), "Renewable Energy & Energy Efficiency", Energy Topics, World Bank website (http://go.worldbank.org/6XC42PKNI0, retrieved on 22/9/2008).

Appendix: Estimates of selected revenue options for addressing climate change

(Note: this table is expected to be further developed and refined with new data).

Option	Revenue	Notes
2% CDM levy 2008 – 2012 (Adaptation Fund)	USD 80 – 300 million	From UNFCCC (2007)
2% CDM levy post 2012 (From UNFCCC 2007)	USD 100 – 500 million	Low demand in 2030
	USD 1 – 5 billion	High demand in 2030
2% CDM levy post 2012 (estimates based on Bakker et al. 2007)	EUR1.28 billion	Annual in 2020 at 20 €/tCO2-eq
	EUR 8 billion	Annual in 2020 at 100 €/tCO2-eq
Application of a levy similar to the 2 per cent share of proceeds from the CDM to international transfers of ERUs, AAUs and RMUs	USD 10 to USD 50 million	Annual average for 2008 to 2012
	Depends on size of carbon markets post-2012	Any estimate for post 2012 requires assumptions about future commitments
International air travel levy	USD 10 to USD 15 billion	Based on charge of USD 6.50 per passenger per flight
Auction of allowances for international aviation and marine emissions (at $23.6/tCO2)	USD 22 billion	Annual in 2010
	USD 28 billion	Annual in 2020
	USD 35 billion	Annual in 2030
Tobin tax	USD 15 to USD 20 billion	A tax of 0.01 per cent on wholesale currency transactions to raise revenue for Convention purposes
	USD 30 to USD 35 billion	A tax of 0.02 per cent on wholesale currency transactions to raise revenue for Convention purposes

Sources: UNFCCC (2007); Bakker et al. (2007) and own calculations.

ECP Steering Group

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The ECP is a joint initiative of the Climate Policy Research Programme (Clipore) of the Swedish Foundation for Strategic Environmental Research (Mistra) in Stockholm and the Centre for European Policy Studies (CEPS) in Brussels. Established in 2005, the ECP aims to facilitate interaction within the policy research community, mainly but not exclusively in Europe. Its working methods consist of bringing together a select number of policy-makers, negotiators and experts to vigorously debate key topics in the area of international climate change policy and to widely disseminate its conclusions. The ECP actively seeks dialogue with policy-makers and other stakeholders while being dedicated to academic excellence, unqualified independence and policy relevance. The ECP is governed by a steering group, drawn from government and academia. For further information, see: http://www.ceps.eu/Article.php?article_id=484.

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