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Making the Most of Public Finance for Low-Carbon Growth

*Experience of Multilateral Development Agencies in
Leveraging Resources*

Background document

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1-The crucial role of public finance

The estimates for additional investments needed in developing countries to tackle the mitigation challenge are far beyond the currently available resources. This will require mobilizing resources at considerable scale without delay to deliver finance, capacity and technology and maximizing their leverage on public and private investment flows to effectively catalyze a shift towards more climate-friendly outcomes.

Both public finance and market instruments will play an important role in supporting low-carbon investments in developing countries. Public policy will be required to create a business environment conducive to climate friendly investment, including but not limited to decisions that help a long-term, predictable and adequate carbon price to emerge. To fully attract carbon finance flows and maximize their leverage on underlying investment, market-based instruments will have to be complemented by other resources and instruments which can help overcome investment barriers and reach areas likely overlooked by market instruments.

Public funding from a variety of sources (ODA flows, Multilateral Development Agencies (MDAs) support, contributions as being currently discussed in the climate negotiations,¹ and resources developing countries are pulling together out of their core budget to support domestic climate action) will be required to support these actions. As a global climate finance architecture is being negotiated and as mechanisms under consideration may take some time to scale-up (e.g., a global, inclusive carbon market running at full steam), resources of public origin will play a key role in addressing the immediate resource gap. It is therefore crucial to work towards increased mobilization of public resources and make the most out of available public finance.

Drawing on their experience in providing economy-wide support to governments for sustainable development and policy reforms and emerging climate finance instrument, MDAs have been responding to growing demand in “climate smart” investments and institutional and policy measures.

The present note highlights a few examples (that don’t do justice to the whole activities by MDAs) of how MDAs have been successfully leveraging climate finance in the development context, by innovating, demonstrating and catalyzing transformation, to tackle a set of barriers (see Table 1) and accelerate adoption and diffusion of cleaner and safer technologies and to favor uptake by private sector.

The findings and opinions expressed in this report are the sole responsibility of the authors. They do not necessarily reflect the views of the World Bank.

¹ These encompass so-called assessed contributions from GDP (G-77 7 China, Mexico proposals), Norwegian proposal to auction allowances, proposed levies on GHG emissions (Swiss proposal) or on international transport by air or sea (several sponsors), etc.

Table 1: Resources and Instruments to Overcome Barriers to Low-carbon Investment

Barriers	Actions	MDAs Instruments
<p>Misaligned, weak or absent incentives, e.g.:</p> <ul style="list-style-type: none"> -absence of an adequate, long-term and predictable price for carbon; - counter-incentive subsidies; - lack of regulatory framework for renewable energy expansion; -split incentives. 	<p>Creation of Enabling Environment</p> <ul style="list-style-type: none"> -to initiate and/or continue a relevant policy dialogue; -to make adjustments to policy or regulatory framework; -to provide project development funds; -to undertake technology piloting and demonstration; and -to build capacity. 	<ul style="list-style-type: none"> GEF Multilateral Fund (Montreal Protocol) Trust funds, such as ESMAP Bilateral Donor Funds Foundation funding Development policy operations
<p>Low capacity and low awareness of opportunities, costs and benefits of mitigation by project developers and sponsors and domestic financiers.</p>		
<p>Chronic lack of funding, e.g.:</p> <ul style="list-style-type: none"> -high cost of capital/low liquidity in domestic financial markets; <p>-high (perceived) country or technology risks.</p>	<p>Investment Resources</p> <ul style="list-style-type: none"> - use of concessional resources to provide significant investment resources for medium to long-term investments at favorable rates to compensate for marginal rates of return - actions to deepen domestic financial markets - to cover risks or enhance credits associated with new technology, business models, resource certainty, and country or currency risks 	<ul style="list-style-type: none"> Grants and concessional loans National investment resources Equity participation GEF (limited incremental investment resources) CTF, SREP Carbon Finance as Revenue Enhancement (to provide additional revenue stream to improve financial viability of investment) CTF (partial risk guarantees) GEF (limited non-grant risk coverage) MIGA

2-Buying down the cost of low-carbon investment

MDAs have been drawing on climate change dedicated resources and instruments – to match the additional costs of low-carbon action and leveraging those with their regular development finance resources and instruments (as well as other sources of finance) – to deliver development benefits. The instruments under UNFCCC, the Global Environment Facility, or GEF (long the only instrument to address climate change) and CDM (potentially the largest channel to catalyze low-carbon investment through

revenue enhancement), as well as the Climate Investment Funds, or CIF (the most recently established highly concessional resources) constitute the bulk of available resources to catalyze mitigation action in developing countries.²

2-1 Piloting innovation with the GEF

Under the Climate Change focal area, as the financial mechanism of the UNFCCC, the **Global Environmental Facility** (GEF) trust fund currently devotes about US\$250 million per year to climate change over 2007-10 (GEF-4). It is the largest source of grant financing for mitigation³ and so far, the GEF has invested US\$2.6 billion to support climate change mitigation in developing countries and EITs, with another US\$14 billion in co-financing (or a leverage factor of 6.4). Even with limited resources, GEF interventions have been critical in steering transformation of larger projects towards more climate-friendly outcomes. Areas of engagement include Energy efficiency and Renewable energy (focusing on barriers removal), Technology (focusing on promising technologies, not yet commercial to bring down their cost through learning-by-doing and facilitate their deployment), Transport (since 2000) and to a lesser extent Terrestrial Carbon (GEF-4, with a methodological focus). In a context of limited resources to address multiple, ever-growing and often interlinked environmental challenges, Box 1 highlights an example of innovative combination of dedicated sources of funding (including GEF) to support project and programs that deliver multiple benefits and maximize leverage of public monies.

Box 1: Building on Synergies between GEF, Montreal Protocol Funding and Carbon Finance

The India Chiller Energy Efficiency Project (CEEP) seeks to improve energy efficiency of building chillers (a major source of power demand) and accelerate phasing out of ozone depleting substances by providing an incentive to overcome the upfront capital cost barrier of replacing and upgrading older CFC-based chillers by more efficient non-CFC-using ones. Despite potential 40% improvement in energy consumption, most building owners/managers have not embraced early timely replacement of outdated chillers given higher upfront capital requirement, perceived technology risks and high opportunity costs.

The objective is to replace a total of 370 chillers (out of a total market size of about 1,200 chillers), over a period of 3 years, with an average incentive of 20%, leading to an estimated (direct and indirect) 13 MtCO₂e reduction in GHG emissions over 20 years. It draws on an innovative combination of GEF and MLP resources (up-front subsidy for early adopters of new chiller technology) and carbon revenues (contributing to a revolving fund to support replacement of additional chillers). This project illustrates how a limited upfront provision (less than 10%) of highly concessional resources (mostly from GEF) can potentially mobilize a much larger amount of resources (total cost of replacement estimated at US\$90 million) with greater transformation impact (more than 25% of chillers are targeted), building on synergies and maximizing effectiveness of resources use and increasing their leverage. A similar project is being prepared in the Philippines while Indonesia has expressed also its interest.

² Through grant financing for knowledge products, capacity building, upstream project work or implementation pilots, (Donors) Trust Funds are also critical in laying the ground for climate action.

³ Most of GEF support is for mitigation, except the Strategic Priority to Pilot an Operational Approach on Adaptation (SPA), a funding allocation within the GEF trust fund of US\$50 million till 2010.

2-2. Scaling up Finance and Impact with the CIF

Approved in July 2008, The **Climate Investment Funds** (CIF) represent a balanced partnership of contributor and recipient countries implementing innovative climate financing through the MDBs to bridge the financing and learning gap between now and a post-2012 global climate change financial architecture. With over US\$6 billion in pledges from more than 10 donors, the Climate Investment Funds are comprised of the Clean Technology Fund (CTF), financing scaled-up demonstration, deployment and transfer of low-carbon technology for significant greenhouse gas (GHG) reductions; and the Strategic Climate Fund (SCF), financing targeted programs in developing countries to pilot new climate or sectoral approaches with scaling-up potential (so far, climate resilience, forestry and renewable energy in low-income countries).

Box 2: Clean Technology Fund (CTF) at work

Three investment plans endorsed with a total funding envelope of over \$1 billion leveraging over \$10 billion

Mexico

Energy Efficiency—Program to replace inefficient lighting and appliances with expected emissions reductions of 4 million tons of CO₂ per year

Urban Transport—20 bus rapid transit corridors with low-carbon bus technologies

Renewable Energy

Proposed CTF \$500 million » leverages » \$6.2 billion

Turkey

Renewable Energy—Implementing “intelligent” grid management and control systems to support large-scale integration of wind power

Renewable Energy and Energy Efficiency—Promoting private sector development through credit lines to local development banks

Proposed CTF \$250 million » leverages » 2.1 billion

Egypt

Wind Power—From <1,000 MW to 2,500 MW of electricity from wind

Urban Transport—Six bus rapid transit corridors and five light rail routes

Proposed CTF \$300 million » leverages » \$1.9 billion

First project approved by MDB Board: Turkey Renewable Energy and Energy Efficiency Project (World Bank) \$100 million CTF with \$500 million IBRD loan, \$550 million leveraged private sector lending

First private sector project approved by Trust Fund Committee: Mexico Private Sector Wind Development (Inter-American Development Bank/International Finance Corporation) \$15.6 million CTF leveraging \$120 million

More specifically, the CTF seeks to support scaled-up deployment, diffusion and transfer of clean technologies by funding low carbon programs and projects in national plans and strategies and gain (and share) experience and lessons through learning-by-doing. In pursuing a strategy that will combine public sector reform and private sector action, the CTF provides a range of financial products to leverage private sector investments (guarantees and equity). As of June 2009, three Investment Plans have been endorsed (Egypt, Mexico, Turkey), with a CTF funding of US\$1.05 billion and US\$9.11 billion co-financing (or a leverage of 9.7). These plans (see Box 2) consider Renewable energy and Energy efficiency but also Transport, a sector so far hardly explored by the carbon market. Other Investment Plans are under

preparation in Colombia, Kazakhstan, Morocco, Philippines, South Africa, Thailand, Ukraine and a regional program for the Middle East and North Africa region, considering Concentrated Solar Power.

2-3 Deepening carbon markets

So far, the Clean Development Mechanism (CDM) has been a major catalyst of low-carbon investment in developing countries, potentially channeling a flow of additional resources much larger than other existing ones. Over 2002-08, about 1,900 million CERs have been transacted for an approximate value of US\$23billion⁴ and some US\$106 billion in low-carbon investment (of which, US\$95 billion in clean energy investment) benefited from CDM transactions.⁵ Over the period, the average leverage factor of carbon finance stands at 4.6 (6.5 when excluding industrial gas projects). In comparison, ODA for mitigation was about US\$19 billion over 2002-07⁶ and sustainable energy investment in developing countries totaled approximately US\$80 billion over 2002-08.⁷

While the carbon market has grown remarkably quickly over the past few years, a number of challenges and barriers remain that considerably reduce the transformational impact of carbon finance:

- Interested project sponsors still face large uncertainties regarding the eligibility, volume, and prices of credits that their projects could generate. They can secure long-term contracts for carbon purchases, however at a discount to expected price of issued credits and with limited bankability (as discussed below). In addition, uncertainties of the post-2012 front largely shorten the longevity of contract. These two factors (low price, limited tenure) can result in a substantial reduction of expected carbon revenue streams.
- Carbon finance does not address the need for upfront financing of mitigation investments. In general, payment for credits occurs *on delivery*, once the project is operational. Given the risks to the underlying projects, there have been few attempts by financial institutions to monetize forward carbon revenue streams to provide the investment capital required.
- Transaction costs and uncertainties linked to project-based mechanisms (complex and changing rules, delays and bottlenecks along the project cycle, project performance, and so on), as well as the riskier business environments for project-based emission reductions (i.e., perceived technology - (1st of its kind project) or location- (riskier business environment in some places) specific risks), and lack of local capacity may also deter investors.

Following the pioneering example of the WBG, MDAs have actively embarked on efforts to promote sustainable development and leverage new resources through carbon finance. They are exploring and

⁴ This figure does not imply that financial flows of the same amount to developing countries have actually occurred through the primary CDM market over 2002-08. This figure is an estimate of the value of CERs contracts over the period. A vast majority of these contracts are forward purchase agreements with payment on delivery of ERs. Depending on project registration and performance, the amount and schedule of payments may prove quite different.

⁵ Source; K. Capoor and P. Ambrosi (2009). *State and Trends of the Carbon Market 2009*, The World Bank, Washington (DC).

⁶ Source: OECD, Rio Marker for Climate Change <http://www.oecd.org/dataoecd/30/63/43270735.xls>

⁷ Source: after *Global Trends in Sustainable Energy Investment 2009*, UNEP, SEFI, New Energy Finance. Estimates of clean energy investments that benefit from CDM tend to be higher than actual sustainable energy investment in developing countries since many CDM projects are at an early stage (not operational, nor commissioned nor even at financial closure) when CERs are transacted.

piloting a number of avenues to further deepen carbon markets. Highlights of these on-going efforts include the following:

Enhance carbon finance revenues and help secure underlying finance through carbon transactions.

Purchasing beyond 2012, a number of funds and facilities managed by MDAs contribute to overcome this transition period, thereby increasing the carbon revenue streams to projects. Among recently established funds and facilities, the Carbon Partnership Facility (CPF), managed by the WB, can consider purchasing carbon credits up to 2022 and so does the EIB Post-2012 Carbon Fund (focusing exclusively on post Kyoto), which has successfully closed a couple of transactions. ADB is also actively launching a post 2012 fund. WBG has also been active in increasing the leverage of carbon finance through the development of risk management products, such as comprehensive insurance provided by MIGA (covering among others host country political risks related to the government's obligations under/compliance to the Kyoto Protocol) which lowers perceived risks to the buyer, or the carbon delivery guarantee developed by IFC (see Box 3). Finally, MDBs are also active in supporting the development of the carbon market through integrated initiatives that combine carbon transaction activities (offering up-front financing) with capacity building and awareness raising actions (leading to development of carbon finance skills and potentials) and provision of finance (for development of CDM-eligible projects, eventually including underlying finance), the most comprehensive example being the Carbon Market Initiative by the ADB.

Box 3

IFC's Carbon Delivery Guarantee: Managing Risk and Maximizing Returns

Under its Carbon Delivery Guarantee (CDG), the International Finance Corporation (IFC) assures delivery of carbon credits from companies in developing countries to buyers in developed countries. Acting as an intermediary, IFC sells credits on behalf of companies in the global market and passes the attractive prices back to the projects. Clients profit from IFC's credit rating by gaining access to markets and benefit from full price transparency. For buyers in developed countries, IFC provides certainty by eliminating the risk of not receiving the carbon credits when promised. IFC signed its first CDG agreements in Sub-Saharan Africa and South Asia in early 2008 and is actively pursuing other CDG deals throughout the developing world. In South Africa, IFC's agreement is to help sell up to 900,000 carbon credits from Omnia Fertilizers, one of the country's leading fertilizer producers. The installation of a nitrous oxide abatement facility will not only generate carbon credits, it also mitigates pollution by employing cleaner technology that prevents nitrogen oxide (NOx) emissions. In addition, Omnia has committed to contributing 5 percent of revenue generated by the CERs to reducing poverty in the surrounding community. In India, IFC signed a deal for 850,000 carbon credits from Rain CII Carbon (India), an IFC client for over 15 years and now the largest merchant of calcined coke in the world. Their 50 megawatt waste heat recovery power plant will generate power that reduces Rain's dependence on fossil-fuel-based power from the grid in a country with severe power deficits.

MIGA's Support to Private Sector Climate-friendly Engagement

The Multilateral Investment Guarantee Agency (MIGA) developed an innovative instrument to mitigate a series of risks to carbon finance project performance, including host-country political risk such as administrative/regulatory decisions by the government that may affect projects' operations, expropriation, withdrawal from the Kyoto Protocol, and inability of auditors to enter the project site due to politically motivated violence. In fiscal 2006, MIGA provided US\$1.8 million in guarantees for a landfill gas flaring project in San Salvador. MIGA's guarantee helped the investor raise funds from the carbon market and assures the company of reimbursement in the event that a harmful political event puts a stop to operations.

Target systematic programs of investments in a strategic way (as opposed to the more random, short-term project by project mode of today's carbon market), with the Carbon Partnership Facility (CPF) is a key leverage. The CPF ambitions to scale up carbon finance through strategic, long term programmatic approaches that have a transformational impact on emissions and development (energy, oil and gas sector, waste management, transportation, urban).

Address mitigation potentials so far by-passed by the carbon market, with the Forest Carbon Partnership Facility (FCPF) a key channel for action. The FCPF assists developing countries in their efforts to reduce emissions from deforestation and forest degradation (called REDD), providing a fresh source of financing for the sustainable use of forest resources and biodiversity conservation, and for the more than 1.2 billion people who depend to varying degrees on forests for their livelihoods. The FCPF builds the capacity of developing countries in tropical and subtropical regions to reduce emissions from deforestation and forest degradation and to tap into any future system of positive incentives for REDD.

3- Further engaging domestic financial institutions

Credit lines, loan facilities, often used in combination with TA and guarantees are among the instruments that can be applied for the purpose of raising awareness of domestic financial institutions and build their capacity for new lines of business as they may be initially unable or unwilling to loan for such unfamiliar and risky activities. The key idea is to use public finance to offer upfront capital at concessional rates and direct credit to targeted sectors and projects. Once a critical experience has been reached, public support can progressively be phased out while commercial finance gains traction to support low-carbon investment. Box 4 presents successful examples of such application/combination of instruments.

Box 4. Partnering with financial intermediaries

IFC has partnered with GEF in strengthening financial intermediaries and markets to support a more robust investment capability for sustainable energy. Such programs are now operational in eight countries with commitments of more than \$400 million in IFC funds. IFC seeks to expand this business with financial intermediaries to the level of \$500 million in new commitments per year, supporting more than twice that level of lending by other partner banks. For instance, IFC created in 2003 the Commercializing Energy Efficiency Facility (CEEF), an innovative partial guarantee structure designed to leverage over \$225 million in private capital through 14 regional partner banks for energy efficiency renovation and renewable energy projects in the Czech Republic, Latvia, Lithuania and Slovakia. The project works through multiple FI partners to catalyze investment across a broad range of market segments.

PROSOL is a facility under UNEP aiming at accelerating the penetration of solar water heating in Tunisia by targeting domestic financial institutions. Through a temporary interest rate subsidy (phased out 18 months after inception), PROSOL significantly lowered financing cost for installation by end-user. Loans – contracted through local financial institutions – could be repaid through utility bills. This provided enough guarantees for domestic banks to extend five years loans instead of the usual three-year term and an interest rate reduction. PROSOL overcame the capital cost barrier, through simple and affordable loans (whose repayment match monthly electricity bills) and proved an effective inducement for domestic banks (who carry 100% of the loan risk). PROSOL has achieved some notable success with the capacity added in the year 2006 higher than the cumulative capacity installed in the entire period 1985-1996, when only a capital subsidy program was offered under a different non-UNEP program. Under PROSOL, more than 20,000 Tunisian families now get their hot water from the sun from loans equivalent to \$13 million in 2005/2006 – a substantial leverage to the \$2.5 million initial cost. The results achieved by PROSOL have led the Tunisian government to set a more ambitious target for solar water heating of 540,000 m² in the period 2007-2011. If this target were met, the annual market for solar water heaters in Tunisia would become comparable to current levels of countries such as Spain or Italy with populations 4-6 times higher. PROSOL has also led to an important policy change by the Tunisian government. Solar water heaters are now eligible for the energy subsidy that was previously provided only to LPG. The success of PROSOL has also prompted similar approaches in 11 other countries while Tunisia is looking into Programmatic CDM to scale up transformation building on the success of PROSOL.

4- Mitigating risks attracting investors

Risk-mitigation instruments (Box 5) such as guarantees are also key in increasing investors' and lenders' confidence as they mitigate (perceived) performance and repayment risk, linked for instance to currency, interest rate or commodity price risk, technology risk or non-commercial risk. Guarantees may thus help mobilizing additional (long-term) capital for climate action and lowering borrowing costs (lower risk rating of projects).

Box 5: Risk-mitigation instruments at work for low-carbon growth

With a total estimated cost of \$1.45 billion (including \$200 million in contingencies), Nam Theun 2 (NT2) is the largest investment ever made in Lao PDR and is also the world's largest private sector hydroelectric project financing. NT2 involves the development, construction, and operation of a thousand megawatt trans-basin diversion power plant that is expected to generate \$1.9 billion in foreign exchange earnings over a 25-year period through the export of electricity to Thailand. These earnings will enable the country to increase the amount of money it can invest in health, education, and basic infrastructure for the benefit of the poor. Debt represents about 70% of financing. Multilateral guarantees against political risks were a pre-requisite to secure the support of the dollar lenders. The WBG and ADB cooperated in providing the multilateral guarantees and modest direct lending needed, making the project move forward.

The African Rift Geothermal energy Development Program (ARGeo), a five-year US\$18 million region-wide multi country facility to tap geothermal resources, offers a partial insurance to project promoters/investors against the short-term, upfront risk of geological exploration through a contingent grant. As opposed to a direct grant, this arrangement may support a greater number of projects as non-allocated resources (if projects are successful) can be reutilized for new projects on a revolving basis.

Conclusions:

1-Innovation works – It is critical to share lessons for wider replication and adaptation to national and sectoral circumstances. One example of such an initiative is the Climate Finance Knowledge Platform which is currently being developed jointly by UNDP and the World Bank Group to provide developing countries ideas of enabling policies that shift investments towards low-carbon paths, examples of successful blending of different sources of funds, and information on such sources.

2-There is a need to combine instruments to maximize leverage and provide the best financial package, as instruments serve specific purposes (for instance Carbon Finance enhances future revenues while concessional resources may address up-front financing issues, risk-mitigation instruments may make investors more confident, etc.). Additional work will be needed to lower time and transaction costs of combination instruments and assimilate lessons from experience.

3-It takes more than project finance. Public support will be particularly critical to:

- target non-financial barriers that prevent the full realization of some important mitigation potentials (e.g., low awareness and behavioral inertia constraining investment in energy efficiency improvements, governance issues linked to terrestrial carbon sequestration);
- align incentives for climate-friendly investment (e.g., rationalization of energy subsidies);
- deepen domestic financial markets and local capital markets (e.g., raising awareness and building capacity of domestic financial institutions through piloting instruments such as subsidized loans, credit lines, guaranteed products etc.); and
- support and accelerate R&D and diffusion of climate-friendly technologies.