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Clean Development Fund: A "Public Option" for Carbon Offsets

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Introduction

The Kyoto Protocol—despite its successes[1]—has not put the world on a path toward climate stabilization. Global greenhouse gas (GHG) emissions grew four times faster between 2000 and 2007 than during the previous decade, at a rate above even the "worst-case scenario" predicted by the International Panel on Climate Change.[2]

Under the Kyoto Protocol's global cap-and-trade system, industrialized countries ("Annex I countries") committed themselves to binding GHG emission "caps," which they could achieve either by reducing their own emissions or by "trading" for reduction credits from other entities.[3] Developing countries ("non-Annex I countries"), on the other hand, did not accept caps—a compromise that recognized that developing nations did not contribute to the majority of historical emissions and ensured that GHG restrictions would not impede their economic development. Developing countries did, however, agree to participate in the Clean Development Mechanism ("CDM"), a flexible mechanism that allows industrialized countries to invest in ventures that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries.

Administered by an Executive Board under the auspices of the U.N. Framework Convention for Climate Change ("UNFCCC"), the CDM has grown rapidly since its

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[1] The Kyoto Protocol secured the participation of every nation except Somalia, Afghanistan, Western Sahara, and the United States.

[2] *See* GLOBAL CARBON PROJECT, CARBON BUDGET 2008 POLICY BRIEF 2 (2009), *available at* http://www.globalcarbonproject.org/carbonbudget/08/files/091115 USU-PB10 CARBON 2 BasseDEF.pdf.

[3] The Kyoto Protocol sets national level caps and permits credit trading between nations. However, most of the nations capped by Kyoto have chosen to implement their caps by creating or joining a cap-and-trade system binding on firms within their jurisdiction. Thus, as a practical matter, credit trading occurs at the firm-to-firm level, not at the nation-to-nation level.

inception in 2004. To date, the Executive Board has approved more than 1,800 offset projects. During the 2008-2012 Kyoto compliance period, these projects are expected to produce about 300 million tCO_2 of offsets per year, representing roughly half the reductions needed to reach the system's total cap of 5 percent below 1990 baseline emissions.[4] Six and a half billion dollars flowed to offset projects through the CDM system in 2008 alone, and secondary sales of CDM-derived credits—i.e., buying and re-selling by investors and aggregators—accounted for another $25 billion in financial transactions.[5] However, the CDM is also one of the most maligned features of the Kyoto scheme. Critics take issue with its administrative inefficiencies, questionable environmental benefits, and inequitable distribution of funds. These concerns will only grow as the developed world broadens and deepens its mitigation commitments, increasing demand for carbon offsets.

In December 2009, Parties to the UNFCCC met in Copenhagen, Denmark, to continue negotiating a successor to the Kyoto Protocol, which expires in 2012. This Paper proposes that these Parties consider replacing the Clean Development Mechanism with a Clean Development *Fund*.[6] We argue that a centralized, publicly administered Fund would improve the CDM's structure in three ways, and we allocate one Part to each improvement.[7] Part I examines the high transaction costs and administrative inefficiency

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[4] KARAN CAPOOR & PHILIPPE AMBROSI, WORLD BANK, STATE AND TREND OF THE CARBON MARKETS 2009, at 1 (2009), *available at* http://wbcarbonfinance.org/docs/State___Trends_of_the_Carbon_Market_2009-FINAL_26_May09.pdf (estimating 300 million tCO_2 of offsets per year); United Nations Framework Convention on Climate Change, Annual compilation and accounting report for Annex B Partied under the Kyoto Protocol 9 (Dec. 1 2008), http://unfccc.int/resource/docs/2008/cmp4/eng/09r01.pdf (showing "base year" Annex 1 emissions of 12.03 billion tCO2); Unep-Riso Centre, CDM/JI Pipeline Analysis and Database, http://cdmpipeline.org/overview.htm (last visited Jan. 26, 2010).

[5] CAPOOR & AMBROSI, *supra* note 4, at 1.

[6] Our suggestions about the CDM are relevant to the design of other offset systems, particularly as the United States contemplates using a CDM-like offsetting system in its domestic climate change legislation. *See* OFFICE OF ATMOSPHERIC PROGRAMS, EPA, EPA ANALYSIS OF THE AMERICAN CLEAN ENERGY AND SECURITY ACT OF 2009 H.R. 2454 IN THE 111TH CONGRESS (2009), http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf; Written Testimony of Michael Wara to the U.S. Senate Committee on Energy and Natural Resources 8 (Sept. 15, 2009), *available at* http://energy.senate.gov/public/_files/ WaraTestimony091509.pdf [hereinafter Wara Testimony] (concluding that more than half of all reductions through 2030 under the bill would come from offsets, not direct reductions).

[7] This fund would be modeled after the widely praised multilateral fund used by the Montreal Protocol to reduce depletion of the ozone layer. Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1550. Former U.N. Secretary General Kofi Annan referred to the Montreal Protocol as "[p]erhaps the single

that are implicit in the complex CDM structure and argues that the Fund's simpler, streamlined approach would deliver more mitigation per offset dollar. Part II summarizes the serious concerns about the environmental credibility of CDM offsets and argues that a fund-based reform would increase the percentage of funds successfully directed toward projects that represent real GHG reductions. Part III explains that a Fund model could better target funds to projects that promote sustainable development, one of the original goals of the CDM. We conclude with a political reality check. While the wholesale replacement of mechanism-based offsetting faces large political hurdles, support for a fund of some kind is gathering momentum and deserves more attention from academics and policymakers.

I. A Fund Approach Will Improve Efficiency of the Offsetting Process

Many commentators have voiced dissatisfaction with the CDM's high transaction costs and long administrative lag times.[8] In this Part, we trace the CDM's inefficiency to its mechanism structure and argue that a fund-based offset system could improve efficiency.

A. The Structure of the Carbon Market Under the Mechanism-Based Offsetting

CDM offset projects require several complex interactions and rely on a number of different supporting players. First, the developer of a potential GHG-reduction project in a non-Annex I country must quantify the project's emission reductions using a scientific methodology approved by the Executive Board—a task that typically requires the developer to contract with a *consultant* that specializes in CDM applications. The project and its consultants then submit the project proposal to a *Designated Operational Entity ("DOE")*, one of the organizations on which the CDM's Executive Board relies for project validation. If the DOE validates the project's conclusions, the project is entitled to registration by the Executive Board as a matter of course unless the Executive Board requests review. Review requests often result in rejection of the project or a request for clarification by the project developer. If the project achieves registration, the Executive

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most successful international agreement to date." U.S. Dep't of State, The Montreal Protocol on Substances that Deplete the Ozone Layer, http://www.state.gov/g/oes/env/83007.htm (last visited Jan. 21, 2010). We are also indebted to the work of Professor Michael Wara at Stanford University. Michael W. Wara & David Victor, *A Realistic Policy on International Carbon Offsets* 9 (Program on Energy and Sustainable Dev., Working Paper #74, 2008), *available at* http://iis-db.stanford.edu/pubs/22157/WP74_final_final.pdf.

[8] *See, e.g.*, CAPOOR & AMBROSI, *supra* note 4, at 45-51; INTERNATIONAL EMISSIONS TRADING ASSOCIATION, STATE OF THE CDM 2008: FACILITATING A SMOOTH TRANSITION INTO A MATURE ENVIRONMENTAL FINANCING MECHANISM 7–9 (2008), *available at* http://www.ieta.org/ieta/www/pages/getfile.php?docID=3111.

Board issues Certified Emission Reduction credits ("CERs") on a yearly basis, subject to the DOE's validation of ongoing monitoring reports.

Once it receives its CERs, the project developer will sell them to a buyer who wants offset credits for cap-and-trade compliance. Since it is not easy for buyers and sellers to find each other, this transaction typically occurs via an *intermediary*. In some cases, the intermediary may act as a broker, taking a percentage of the sale price in exchange for linking the two parties. In other transactions, intermediaries will instead hold the credits on their own balance sheet, thereby taking on the additional role of credit *aggregator*.[9] Aggregators are important to the CDM market because neither project developers nor credit purchasers want to accept the risk of project failure.[10] Aggregators enter the transaction between the parties, buying relatively risky undelivered credits under a forward contract with the project developer. They pool these credits into a portfolio with credits expected from other projects, thereby reducing the variability in the expected yield of the whole portfolio[11] and allowing them to sell "guaranteed" credits to compliance buyers. Aggregators are typically compensated for their risk reduction and risk assumption by the price spread between the risky credits they buy and the guaranteed credits they sell. For example, early-stage CDM projects sell their credits for about €7, and compliance buyers buy guaranteed credits for around €10, with the difference going to the intermediaries and aggregators that stand between the two parties.[12]

Other entities support the crediting and sale transactions, too. For instance, the financial intermediary need not deliver the credits directly to a compliance buyer; it may also sell them to *speculators* interested in betting on the price of carbon. In evaluating the riskiness of their credit portfolios, both speculators and aggregators rely on *rating agencies*, which rate carbon assets in the same way that Moody's or Standard & Poor's rates traditional assets.[13] Finally, many of these transactions require negotiated contracts with terms governing price, delivery, and risk allocation for several dimensions of risk. This implicates yet another category of supporting players: *lawyers*.

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[9] *See* Tyler McNish et al., *Sweet Carbon: An Analysis of Sugar Industry Carbon Market Opportunities Under the Clean Development Mechanism*, 37 ENERGY POL'Y 5459, 5465–66 (2009).

[10] The credit purchasers prefer to buy credits under a contract that guarantees delivery, so that they will not be exposed to spot market prices in the event that the seller fails to deliver. However, the project developers typically loathe to write such guarantees, as they need a guaranteed stream of future income in order to secure the debt financing for the project itself.

[11] The principle behind this pooling is the same as that behind the aggregation of mortgages by Fannie Mae and Freddie Mac.

[12] CAPOOR & AMBROSI, *supra* note 4, at 39–40.

[13] *See* Carbon Rating Agency: Overview, http://www.carbonratingsagency.com/about-us/overview/index.html (last visited Jan. 21, 2010).

B. Structural Complexity and Inefficiency in the Mechanism Model Cause High Transactions Costs and Lag Times

Existing estimates of transactions costs in the CDM vary widely, ranging from less than 2 percent of total offset spending to over 50 percent of total spending, with most estimates hovering around 4 to 6 percent of total costs.[14] Unfortunately, these estimates are based on self-reported data from early (and therefore possibly non-representative) CDM projects. They also employ widely variant transaction cost definitions, making it difficult to assess their accuracy.

The magnitude of some CDM costs, however, is obvious without a detailed study. For example, as discussed above, the price spread between "primary" offsets and guaranteed offsets is around 30 percent of total offset investment. From the perspective of compliance buyers, this is the largest single cost of using the CDM system.[15] Moreover, these costs are exacerbated by the non-pecuniary—but no less real—cost of administrative time delays. Project applicants wait an average of over 300 days for DOE validation and another 200 days for Executive Board certification.[16] Indeed, there is a queue of thousands of projects backed up behind the certification bottleneck. Some commentators predict that delays will grow even longer as offset demand increases.[17]

These transaction costs and lag times might be worth tolerating if we believed that decentralized, market-based coordination of economic activity is inherently superior to a centralized, publicly-administered alternative.[18] Our own view, however, is that the

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[14] *See* Axel Michaelowa & Frank Jotzko, *Transactions Costs, Institutional Rigidities, and the Size of the Clean Development Mechanism*, 33 ENERGY POL'Y 511, 521 (2005); Hannah Mari Ahonen & Kari Hamekoski, *Transactions Costs Under the Finnish CDM/JI Pilot Programme* (University of Helsinki Dep't of Econ. & Mgmt, Discussion Paper No. 12, 2005), *available at* http://www.mm.helsinki.fi/mmtal/abs/DP12.pdf; CAMILLE ANTINORI & JAYANT SATHAYE, ASSESSING TRANSACTION COSTS OF PROJECT-BASED GREENHOUSE GAS EMISSIONS TRADING 31 (2007), *available at* http://are.berkeley.edu/~antinori/LBNL-57315.pdf; Mattias Krey, *Transaction Costs of Unilateral CDM Projects in India: Results from an Empirical Survey*, 33 ENERGY POL'Y 2385, 2391 (2004); Bruce Chadwick, Transaction Costs and the Clean Development Mechanism, Natural Resources Forum (2006) (unpublished draft manuscript), *available at* http://www.bruce.chadwick.org/Assets/ Chadwick-CDMdocV2.1d.pdf.

[15] CAPOOR & AMBROSI, *supra* note 4, at 39–40.

[16] *Id.* at 46.

[17] *See, e.g.*, Wara Testimony, *supra* note 6, at 5–7.

[18] For the canonical articulation of this idea, see F.A. HAYEK, THE ROAD TO SERFDOM (1944). Indeed, the CDM's design may reflect policymakers' belief that market organization of economic behavior is superior to government organization. *See* David M.

boundary between markets, firms, and governments can only be set on an industry-by-industry basis, according to the characteristics of each industry.[19] One need look no further than the 2008 implosion of the mortgage industry—where market trading of securities to discipline capital allocation decisions bears a striking resemblance to the structure of the carbon offsets industry—for evidence in support of our perspective.[20] If the traditional financial industry's experiment in allocating capital via a securitization mechanism was so unsuccessful, can we really expect the new "carbon finance" industry to do any better?

C. How Fund-based Offsetting Would Work

We argue that a fund-based model would allocate developing country offset funds at least as well as the current, decentralized system, and at a lower cost. At the core of the system would be an investment fund run by an international public-sector organization analogous to the present day Executive Board. Projects in developing countries would measure their expected emissions reductions in the same way as they do under the CDM, but they would apply to the Fund for funding, not certification. On a yearly basis, the Fund's managers would select the most attractive projects and disburse grants, low-interest loans, loan guarantees, or equity.

On the buyer side of the offset market, the Fund would continue to function as a cost-control mechanism by issuing offset credit that Annex I countries can use to meet their compliance obligations. Under the fund model, however, each participating entity would receive offsets in proportion to its contribution to the Fund rather than purchase them from a project or third-party aggregator of credits from several projects.[21]

Driesen, *Sustainable Development and Market Liberalism's Shotgun Wedding: Emissions Trading Under the Kyoto Protocol*, 83 IND. L.J. 21, 23–25 (2008).

[19] *See generally* Ronald H. Coase, *The Nature of the Firm* (1937), *in* OLIVER E. WILLIAMSON & SIDNEY G. WINTER, THE NATURE OF THE FIRM ORIGINS, EVOLUTION, AND DEVELOPMENT 18, 19 (1993); Oliver Williamson, *Public and Private Bureaucracies: A Transactions Cost Economics Perspective*, 15 J.L. ECON. & ORG. 306 (1999).

[20] MICHELLE CHAN, FRIENDS OF THE EARTH, SUBPRIME CARBON: RETHINKING THE WORLD'S LARGEST NEW DERIVATIVES MARKET 2 (2009), *available at* http://www.foe.org/pdf/SubprimeCarbonReport.pdf.

[21] How, exactly, the Fund would distribute credit is a question beyond the scope of this article. For our present purposes, it suffices to note that the Fund would have to choose between at least three broad approaches, all of which have advantages and disadvantages. First, each Fund participant could receive a share of the annual emissions reductions actually achieved by the Fund equal to its contribution to the Fund. This system would preserve the environmental integrity of the system by issuing offsets only after actually achieving emissions reductions, but it would force Annex I entities to either contribute money to the fund without first knowing exactly how many offset credits it would receive

D. How a Fund-Based Structure Would Reduce Complexity and Increase Efficiency

The Fund model has at least two significant efficiency advantages over the mechanism model. First, the Fund achieves directly what a mechanism achieves indirectly. An offset mechanism makes marginal clean development projects viable by inventing a notional commodity, awarding the commodity to projects, and thereby allowing the projects to generate a supplemental stream of offset income to attract loans. An offsetting fund would reach the same result via a more direct route—it would simply invest in the project. Where the mechanism requires two transactions (an approval transaction and a sale transaction), the Fund requires only one (the approval transaction). In this way, the Fund would halve the mechanism's negotiation, contracting, and other search costs. At the same time, its simplicity arguably would make it less susceptible to the kind of unforeseen shocks that periodically rock other complex, interdependent financial systems.

Second, the Fund itself would operate as an intermediary and risk pool. This would be a boon to capped entities because it would obviate the need for the private-sector aggregation and intermediation services that account for the lion's share of transaction costs under the present-day CDM. When a capped entity needs an offset, it would simply purchase it at the government window.

II. A Fund Model Will Improve the Environmental Accuracy of Offset Awards

A. Environmental Criticism of CDM-Approval Decisions

CDM critics have convincingly argued that up to two-thirds of emission credits generated under the CDM do not reflect real GHG emission reductions.[22] Early criticism from the environmental community focused on the CDM's disproportionately large awards to the destruction of trifluoromethane (HFC-23), a potent GHG and byproduct of

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per dollar, or to pay an intermediary to accept the risk by standing between the Fund and the entities. Second, the Fund could sell or auction offsets credits ex ante, using the proceeds to fund projects. This system would allow the capped entities to buy "safe" offsets, but would potentially undermine the environmental integrity of the system by preventing the Fund from ensuring ex ante that the money it collects for each 1 tCO_2 offset would allow it to achieve emissions reductions of 1 tCO_2. Third, the Fund could implement a hybrid system by using "head start" funding from governments to invest in projects before the beginning of the compliance period and then selling or auctioned the resulting offsets to buyers. These three approaches also vary in their viability as a "supply response" or "price safety valve" to demand spikes inside the cap-and-trade system.

[22] *See* Patrick McCully, *The Great Offset Swindle: How Carbon Credits Are Gutting the Kyoto Protocol, and Why They Must Be Scrapped*, DAMS, RIVERS & PEOPLE 2008, at 3, *available at* http://www.internationalrivers.org/files/DRP2English2008-521_0.pdf.

refrigerant manufacturing.[23] Because simple technological fixes could cut HFC-23 emissions at a relatively cheap cost, refrigerant manufacturers were able to earn nearly twice as much from selling CDM credits as they could from selling their actual product.[24] This created the perverse incentive for investors in China to build new refrigerant plants simply to cash in on the CDM-credit windfall—thereby adding to global GHG emissions, instead of actually reducing them.

More recent environmental criticism centers on the related problem of determining the "additionality" of a proposed project—that is, whether project investment would have occurred in the absence of the CDM. The Kyoto Protocol specifies that only "additional" projects merit CDM credits, not projects that would have happened anyway under "business as usual." If emission reductions are not additional, the thinking goes, then they do not "offset" other emissions and should neither receive funding through the CDM nor be used for CDM compliance. The additionality concept is itself is uncontroversial, but devilishly difficult to apply in practice: which industrial practices, exactly, would prevail in the counterfactual "business as usual" world? Would a proposed wind farm replace a (relatively dirty) coal plant or a (relatively clean) natural gas plant? And what rate of return would be sufficient to make an investment attractive even without the CDM incentive?

With these thorny questions in mind, several studies have estimated that up to 40 percent of all projects certified by the CDM are not additional.[25] Some critics go even further, arguing that no viable method of measuring additionality exists, as the idea of additionality presupposes the ability to measure emission reductions in a counterfactual, hypothetical state of the world.[26]

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[23] Michael Wara, *Is the Global Carbon Market Working?*, 445 NATURE 595, 595–96 (2007).

[24] *Id*. at 595.

[25] LAMBERT SCHNEIDER, IS THE CDM FULFILLING ITS ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT OBJECTIVES? 9 (2007), http://www.oeko.de/oekodoc/622/2007-162-en.pdf (stating additionality of 40 percent of projects is "unlikely or questionable"); AXEL MICHAELOWA & PALLAV PUROHIT, ADDITIONALITY DETERMINATION OF INDIAN CDM PROJECTS: CAN INDIAN CDM PROJECT DEVELOPERS OUTWIT THE CDM EXECUTIVE BOARD? 4 (2007), http://www.noe21.org/docs/Michaelowa-teripress-2007 (explaining less than 50 percent of projects in India provide adequate additionality information); Christoph Sutter & Juan Parreño, *Does the Current Clean Development Mechanism (CDM) Deliver Its Sustainable Development Claim? An Analysis of Officially Registered CDM Projects*, 84 CLIMATIC CHANGE 75, 86 (2007) (finding additionality is "unlikely" for 11 out of 16 projects analyzed).

[26] Wara & Victor, *supra* note 7, at 17.

B. Environmental Concerns Can Be Traced to the Mechanism Model

We recognize the intractability of the counterfactuality problem but argue that the CDM's existing structure exacerbates its severity. Mechanism-based offsetting casts the system regulator in a passive role, limiting it to making a "yes" or "no" decision on the environmental benefits of project applications. This has four implications:

First, mechanism regulators have limited access to information about the projects they evaluate. They must rely on the claims of the project developers, which are not cross-examined by any other interested party and are not easily compared against claims by similar projects competing for funding.

Second, this project-by-project perspective can lead to results that are reasonable on the individual level but nonsensical in the aggregate. As others have noted, it is plausible that any given Chinese non-coal power plant is additional, but it is not plausible that *every* new non-coal power plant is. Yet, the CDM has awarded funding to virtually all new non-coal capacity in China.[27]

Third, mechanism regulators have a limited ability to respond to the unintended consequences of system design flaws. The HFC-23 projects, which funded the destruction of a refrigerant byproduct with 11,700-times the greenhouse potential as CO_2, are a case in point. Because HFC-23 mitigation was credited at 11,700 times more per ton than CO_2 mitigation, but did not *cost* 11,700 times more, HFC-23 projects dominated the early CDM market. The project developers reaped windfall profits well in excess of any reasonable estimate of the incentive needed to convince them to implement their projects. The affair was an example of the mechanism's perverse incentives in action.

Fourth, the mechanism model makes it relatively difficult to fund programmatic activity such as changes to environmental laws and policies or efforts to speed the diffusion of clean technologies like cook stoves in rural areas. Despite strong interest in funding such activities, the CDM has had a difficult time developing procedures to govern them.[28] One explanation for the delay is that such projects are often unique efforts more suited to an individualized approval process than to the CDM's mechanistic methodology and additionality requirements.

C. A Fund-Based Model Will Improve the Environmental Soundness of Funding Decisions by Recasting Passive Regulators as Active Fund Mangers

A Fund model would recast the CDM's passive regulators as active fund managers. This active role would give them the ability to compare projects side by side, scrutinizing the additionality claims of project developers. Indeed, project developers would compete for funding, and fund managers would have the luxury of choosing only the projects that are most environmentally sound, rather than approving all projects that

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[27] *Id.* at 13–14.

[28] *See* CAPOOR & AMBROSI, *supra* note 4, at 50–51.

purport to meet the CDM's substantive criteria. Fund managers would also benefit from a holistic perspective. In making their yearly funding decisions, they could more easily note that a large percentage of Chinese power plants claim additionality, and thus re-calibrate their funding decisions accordingly. For example, they might choose to take a "programmatic" approach to incentivizing the Chinese power plant sector by contracting with the Chinese government to set technology standards or to limit the expansion of coal in certain regions—an approach that would fit more naturally in the flexible, managed fund model than in the mechanism model. Finally, fund managers would be better able to correct design flaws in real time. For example, instead of overcompensating the HFC-23 developers, managers negotiating a funding contract could have incentivized those projects' emissions reductions at reasonable rates with grants.

Of course, there are also dangers implicit in the fund model. The mechanism uses investors' self-interest to ensure that funds flow to the projects that achieve the most mitigation per dollar. The fund structure contains no such automatic discipline. In other words, there is nothing to stop fund managers from making bad decisions, whether those bad decisions are the result of willful political cronyism or an innocent inability to effectively compare all investments.

We take this concern seriously, but believe that internal management structures can effectively control and standardize manager decisions. Specifically, we propose that allocation of funds through a reverse auction could rationalize the award process and ensure that funding continues to flow to the projects that get the most "bang for the buck."[29] Under our proposal, on a quarterly basis, project developers would offer emission reductions to the Clean Development Fund at a price of their choosing. For example, a wind project in China may offer 100,000 tCO_2e of emission reductions in exchange for a €1m grant; a solar project in Bolivia may offer the same quantity of emission reductions in exchange for an €800,000 grant. The fund managers would rank the two projects (along with all other projects submitted) according to the cost per tCO_2e of their estimated emission reductions. In this case, the Bolivian project, with a cost of \$8/tCO_2e, is ranked ahead of the Chinese project, with reductions costing \$10/tCO_2e. The Fund will award funding to projects in the order of their cost per tCO_2e rank until its funds are exhausted, such that only the most cost-effective emissions reductions proposals are funded.

The reverse auction, in other words, would partially "mechanize" the Fund. Like the current CDM, it would target funds toward the projects that achieve the lowest-cost emission reductions. Unlike the CDM, however, the reverse auction would not award a final right to CDM funding but rather would serve as a tool to assist fund managers. In this way, it would preserve enough flexibility to allow the Fund to operationalize the advantages of the fund model discussed above—that is, it preserves fund managers' power to (1) scrutinize projects side by side (indeed, this is the auction's core purpose); (2) take a holistic perspective on the offset market as a whole during each funding cycle;

[29] On reverse auctions for climate change mitigation, *see* Michael Wara, *Measuring the Clean Development Mechanism's Performance and Potential*, 55 UCLA L. REV. 1759 (2008).

(3) pursue attractive programmatic activities outside of the context of the auction; and (4) respond aggressively to design flaws.

III. A Fund Model Will Achieve the CDM's Sustainable Development Goal

The Kyoto Protocol set out two purposes for the CDM: (1) helping developed countries cost-effectively comply with their mitigation obligations; and (2) assisting developing countries in achieving sustainable development.[30] Significantly less academic attention has focused on the performance of the CDM's second goal than on its first, but there are several reasons to believe that the CDM does a poor job of incentivizing true sustainable development. A large percentage of CDM credits to date came from HFC-23 and hydroelectric projects, which critics argue do not represent sustainable development.[31] Funding for projects with strong social or equity aspects—such as rural cook stove projects—has been scarce, even though credits derived from such projects attract premium prices.[32] Moreover, projects of all classes are geographically concentrated in a relatively small number of nations. CDM investment in Africa is particularly low.[33]

The Fund would improve offsetting's sustainable development performance in largely the same way as it would improve its environmental performance. By giving fund managers more discretion over the targeting of funds, a fund would make it easier to direct money to the projects with the greatest sustainable development characteristics and other co-benefits. The reverse auction system could incentivize this targeting by using priority weighting factors that allow fund managers to fine-tune the auction with objective numerical factors to alter a project's auction rank. For example, fund managers could severely discount projects with high social costs not represented in the pecuniary cost figure reported by the project. This would make a large dam project with high human rights risks less competitive in the reverse auction. Similarly, fund managers could apply positive weighting factors to incentivize desirable but under-funded classes of projects. For example, transactions costs and other market imperfections may lead to sub-optimal funding of projects in Least Developed Countries or renewable energy projects which are otherwise limited by high equipment cost and low CER return.

Once established, these transparent numerical weighting factors would send a clear price signal to investors and applicants, incentivizing the types of projects that would further the oft-overlooked "sustainable development" purpose of the global offset system. Further, fund managers could establish an open and inclusive process to develop

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[30] Kyoto Protocol to the United Nations Framework Convention on Climate Change, art. 3, Dec. 10, 1997, 32 I.L.M. 22.

[31] *See, e.g.*, Axel Michaelowa & Katharina Michaelowa, *Does Climate Policy Promote Development?*, 84 CLIMATIC CHANGE 1 (2007).

[32] CAPOOR & AMBROSI, *supra* note 4, at 50.

[33] *Id.* at 35 (showing that Africa's share of the CDM market by volume is 2 percent).

the appropriate numerical factors, which would bring to the forefront human rights and other concerns that are often under-represented in climate change policy discussions.

Conclusion

Each of this Paper's three sections presents a problem inherent to the Kyoto Protocol's mechanism model. The mechanism's inefficient Rube Goldberg-esque design encourages offset developers to game the system. As a result, the system's referee (the Executive Board) must make expenditures in administrative controls. Though well intentioned, these administrative hurdles have destructive consequences: they are only partially effective in excluding undesirable projects; they unfairly exclude some desirable projects; they are expensive for all parties involved; and they have undesirable equity characteristics.

We argue that a fund-based reform has the potential to rationalize the offsetting process by eliminating expensive, unnecessary, and dangerous structural complexity and by re-casting passive regulators as active, responsive fund managers who will make funding decisions that are more environmentally sound and that do justice to their sustainable development mandate.

At this stage in the ongoing climate negotiations, however, we would be remiss to focus only on a fund's operational advantages while ignoring the question of its political viability. The Fund faces at least two big political hurdles. First, sheer inertia and the political power of current carbon markets participants—who derive much of their projects from the CDM's large transaction costs—may make it difficult to jettison the mechanism concept. The International Emissions Trading Association is an influential voice in the international debate, and investment banks and other financial-sector firms have a strong capacity to influence decisions in Washington D.C. Second, debate over the management of the Fund is likely to be extremely controversial. Within the United States, many will object to government-directed investment. At the international level, the management question will likely provoke tension between the developed and developing worlds. Annex I nations will want to control the Fund, since they are the source of its capital. But non-Annex I nations will want control in order to ensure that funding is targeted to their developmental priorities.

At the same time, there is reason for cautious optimism about the political viability of the fund approach. For one thing, efficiency is the least controversial value. By increasing the percentage of each dollar of funding that achieves mitigation, the Fund approach benefits everyone (but the middlemen), and should have a broad constituency. Similarly, while environmental soundness arguably is not in offset participants' short-term interest (buyers and sellers just want to complete the transaction), it is in *everyone's* long-term interest.

Appendix 1: Models of the Mechanism and Fund Approaches

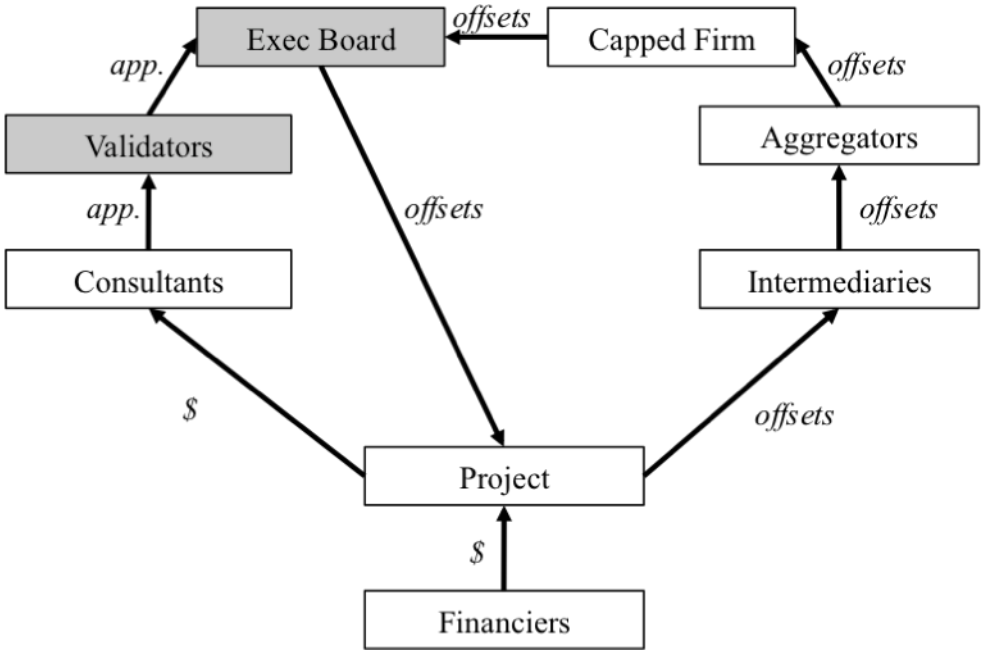

Figure 1: The CDM Mechanism Model

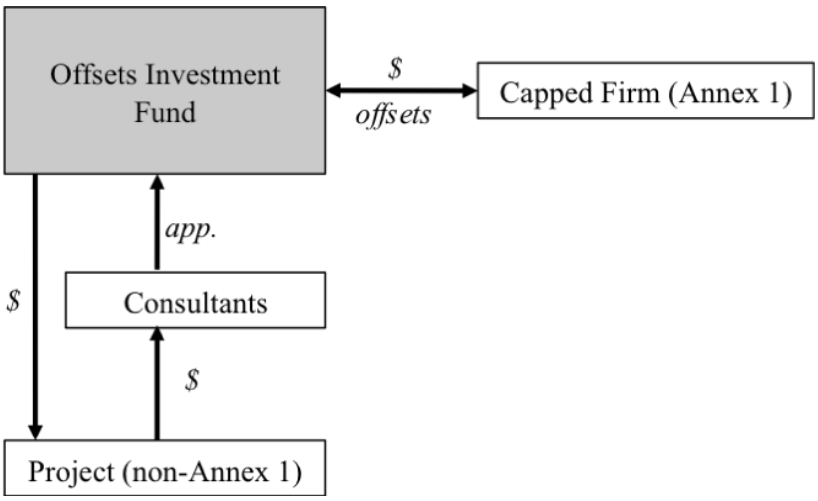

Figure 2: Proposed Fund Model