DAMS, RIVERS AND PEOPLE 2008

Bad Deal for the Planet

WHY CARBON OFFSETS AREN'T WORKING . . . AND HOW TO CREATE A FAIR GLOBAL CLIMATE ACCORD

INTERNATIONAL RIVERS
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About International Rivers

International Rivers is a non-governmental organization that protects rivers and defends the rights of communities that depend on them. International Rivers opposes destructive dams and the development model they advance, and encourages better ways of meeting people's needs for water and energy and protection from destructive floods.

Acknowledgments

This publication was made possible by the generous support of Oxfam Australia, the Blue Moon Foundation and Oxfam Great Britain. The views in the report are those of International Rivers and do not necessarily represent those of our funders.

Patrick McCully: For her extensive research assistance and editorial comments, many thanks to Barbara Haya. Many thanks to Ben Docker for his work crunching data on the CDM and hydropower. Thanks to Ben Pearson, Tom Athanasiou and Peter Bosshard for their comments on the text. Thanks to Axel Michaelowa for analytical assistance. Thanks to Brian Smith of HellerEhrman LLP for legal assistance. Many thanks to Lori Pottinger for support, advice and a most useful edit.

Tom Athanasiou: I'd like to thank the co-authors of the Greenhouse Development Rights proposal, Paul Baer of EcoEquity and Sivan Kartha of the Stockholm Environment Institute. I'd like to thank the many friends and supporters who are helping to move GDRs forward, particularly Joerg Haas of the Heinrich Boell Foundation and Andrew Pendleton of Christian Aid, who have been indispensable. And not at all incidentally, to Sarah Bardeen for a most useful edit.

This report and additional supporting materials can be downloaded at www.internationalrivers.org

Printed in the United States of America

ISBN: 978-0-9718858-6-8

Cite as Lori Pottinger (2008) "Bad Deal for the Planet: Why Carbon Offsets Aren't Working…And How to Create a Fair Global Climate Accord," Dams, Rivers and People Report 2008, International Rivers, Berkeley, CA.

Published by
International Rivers
1847 Berkeley Way
Berkeley, California 94703
USA

Edited and produced by Lori Pottinger

Designed by Jeanette Madden

Printed by Inkworks Press

Printed on 100% recycled paper.

Cover Image: Innosanto Nagara, Design Action

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Welcome to International Rivers' third annual Dams, Rivers and People report. Each year we focus on a key issue affecting the world's rivers and the people who depend upon them. This year we look at why the Clean Development Mechanism is failing to reduce climate pollution, and outline a fair, effective framework for addressing the climate crisis.

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The Great Carbon Offset Swindle

How Carbon Credits are Gutting the Kyoto Protocol, and Why They Must Be Scrapped

by Patrick McCully

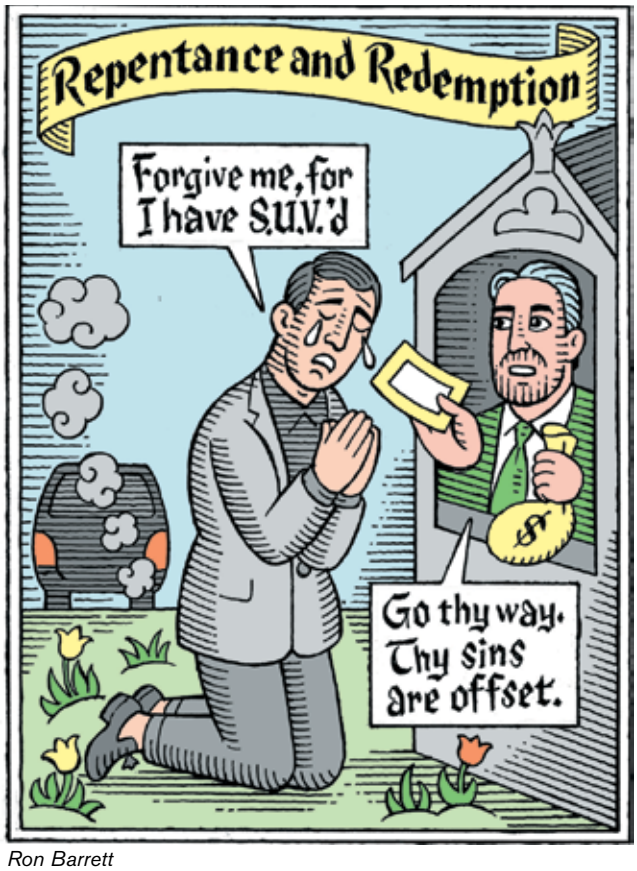
The world's biggest carbon offset market, the Clean Development Mechanism, is a global shell game that is increasing greenhouse gas emissions behind the guise of promoting sustainable development. It is handing out billions of dollars to chemical companies and the developers of destructive dams and fossil fuel projects. A rapidly growing industry of carbon brokers and consultants is lobbying for the CDM to be expanded and its rules weakened further. If we want to sustain public support for effective global action on climate change, we cannot risk one of its central planks being a program that is so fundamentally flawed. In the short term the CDM must be radically reformed; in the longer term it must be replaced.

Carbon offsets seemed like a great idea at the time. The government delegates at the 1997 climate negotiations in Kyoto thought that industrialized countries would save money by buying "emission reduction" credits rather than cutting their own emissions, and developing countries would get the proceeds to fund clean development projects. The climate does not care where emission reductions are made, so why not cut pollution where it's cheapest? At the urging of the US, the world's governments agreed to put offsets at the heart of the Kyoto Protocol.

But Kyoto's offset system, called the Clean Development Mechanism, has flopped.[1] It is a global shell game, a cheats' charter that is increasing greenhouse gas emissions while transferring billions of dollars from consumers and taxpayers to undeserving project developers and a growing army of carbon brokers and consultants. Many hundreds of millions of the supposed "emission reduction" credits represent not a single molecule of avoided pollution, because the offsets are being sold by projects – most commonly hydropower dams, but also wind turbines, biomass power plants, changes to industrial processes, capturing methane from coal mines and many other schemes – that never needed income from the CDM to be built. In these cases, the CDM is increasing global emissions because polluters in industrialized countries are meeting their legal requirements to cut emissions by buying fake credits rather than actually cutting their own emissions.

When the CDM has lowered emissions in developing countries, it has often been a stunningly inefficient means of doing so. And when it does result in a project being built that lowers emissions locally, there is no global climate benefit because the CDM is at best a zero-sum game. Each so-called "emission reduction" generates an offset that just allows an industrialized country to keep on polluting.

The documents written by carbon consultants to justify why specific projects should be approved for CDM offsets



Ron Barrett

regularly contain enough lies to make a sub-prime mortgage pusher blush. Off-the-record and in the corridors at the many carbon-trading conferences, industry insiders will admit that deceitful claims in CDM applications are standard practice. Everyone in the system knows that everyone else is making up stories, and that the system would cease "working" if they didn't.

> "In all the excitement over the imminent arrival of a fully-fledged carbon market, we may be losing sight of one fundamental question – what, exactly, are we trading in?"
>
> ***Environmental Data Services Report***
> **Editorial, July 2004**

Some have warned against pointing out that the carbon offset emperor has no clothes, fearing it will provide ammunition for the global warming denialist lobby's despicable attempts to prevent action on the climate crisis. Yet the real problem lies with the CDM's failures, not with those who are exposing them. The denialists' blogs are already gloating over the CDM's absurdities, and using them to discredit Kyoto and the whole concept of international action to cut greenhouse gas pollution. Stopping the CDM's scams will deny the denialists a confused, lumbering big beast of a target.

The mainstream media has published several withering exposés of the CDM. The UK *Guardian* has accused the CDM of being "contaminated by gross incompetence, rule-breaking and possible fraud." *Newsweek* declared that the CDM's "real winners" have been "polluting factory owners who can sell menial cuts for massive profits, and the brokers who pocket fees each time a company buys or sells the right to pollute." If the mechanism continues without major reforms, more of these stories of malfeasance and farce will follow, all providing plentiful ammunition to those who seek to delay climate action.

In April 2008 the *Wall Street Journal* carried a front page article announcing that the CDM was "in turmoil." The article noted that the UN-appointed board that governs the CDM is rejecting an increasing number of projects for failing to show that they require offset income to go forward. Yet the Executive Board is still rejecting just over one in ten projects that go before it, while independent analysts estimate that up to two-thirds of the CDM's offsets do not represent real emissions cuts.[2]

The official line from the UN is that the CDM is a "great success"[3] and that any problems are only "temporary phenomena."[4] The UN, many governments, and of course the burgeoning carbon trading industry are pushing hard to expand the CDM after the first phase of the Kyoto Protocol expires in 2012. The head of the UN's climate treaty secretariat recently told a carbon industry trade fair that CDM credit sales could reach US$100 billion under a new climate agreement.[5]

It is past time for the UN to halt its CDM boosterism. The core problems of the CDM's project-based offset system are not temporary, but inherent to its design. For as long as the CDM exists, its problems can be mitigated by comprehensive reforms. In the longer term (i.e., post-2012) the only viable solution is to scrap the CDM or transform it into a radically different system. Such a system would need to transfer money from the wealthy countries responsible for most climate pollution to support clean development in poor countries, but without generating permission slips allowing the wealthy to continue polluting.

AL'S BIG MISTAKE

The CDM has been called the "Kyoto surprise." The concept was developed in closed-door negotiations in the final days of the Kyoto conference. It was largely the result of maneuvering by the Al Gore-led US delegation, which morphed a Brazilian proposal for a fund to pay for emission-reduction and climate-change adaptation projects in developing countries, into an offsets-based mechanism.[6]

The US delegation wanted to maximize the use of trading mechanisms within the Kyoto Protocol due to their experience with a 1990s federal program to reduce acid rain. This allocated tradable allowances to power plants to emit sulfur dioxide. It drastically cut sulfur emissions, and many believe (though some disagree) that it did so more quickly and at less cost than conventional regulations.[7]

Based on the sulfur dioxide pollution-trading experience, the US and some other industrialized-country governments believed it would be cheaper to pay for greenhouse gas emission reductions in developing countries than to change their energy infrastructure at home.

Unfortunately, sulfur dioxide trading was a lousy model for an international offsets scheme. Sulfur trading involved one pollutant released by a relatively small number of power plants in one country with a strong capacity to monitor and ensure compliance with the trading program. Climate change involves reducing numerous pollutants released through countless human activities at innumerable locations around the world, often in countries with weak regulatory and legal systems.[8]

Furthermore, the CDM is structured very differently from the US sulfur market. Sulfur trading was a "cap-and-

trade" system; the CDM is a "baseline-and-credit" offsetting system. Under cap-and-trade, a limit on pollution is set that is then ratcheted down over time toward the desired emissions level. Companies in the scheme buy or are given permits or "allowances" to pollute that can be bought and sold like any other commodity. If a company is set to exceed the level of pollution for which it holds permits, it must either buy more permits or take action to cut its emissions – for example, by investing in more efficient equipment or changing its fuel source (or even moving production to somewhere without a cap). As the cap is reduced, permits get scarcer and more expensive, and it becomes increasingly likely that it will be cheaper for companies to cut their emissions rather than buy emissions permits.

Under the CDM's "baseline-and-credit" system, there is no cap on emissions in the developing countries where the projects are located. Instead, individual projects that cut greenhouse gas emissions are given the right to sell offset credits if the projects are "additional" – that is, if they only happen because of the boost provided by the revenue from selling the offsets.

While baseline-and-credit trading may have made sense as a theoretical concept to the sleep-starved negotiators in Kyoto, applying it in the real world has shown it to be fatally flawed. The concept depends on being able to give accurate answers to two inherently unanswerable questions. To know if a project is eligible, one must know whether it is being built only because the developers will be able to sell offsets (is it "additional"). To know how many offsets to grant to the project, one must know what would have happened had the project in question not been built (i.e., what would the business-as-usual "baseline" emissions be). English journalist Dan Welch gives a neat summary of the difficulty of determining the "right" quantity of avoided emissions: "Offsets are an imaginary commodity created by deducting what you hope happens from what you guess would have happened."[9]

A CDM credit is known as a "Certified Emission Reduction" (CER), and is supposed to represent one tonne (metric ton) of carbon dioxide not emitted to the atmosphere. Industrialized country governments that have ratified Kyoto can buy CERs to prove to the UN that they have "reduced" their emissions. Companies can also buy CERs to comply with national-level legislation or, in Europe, with the EU's Emissions Trading Scheme. Almost all the demand for CERs has so far come from Europe and Japan.

CRUNCHING THE CREDIT NUMBERS

The CDM is by far the world's biggest carbon offset market. CER transactions in 2007 totalled $18 billion, more than triple the previous year's figure.[10] More than 1.8 billion CERs are expected to be generated by 2012. The price of CERs varies according to supply and demand. Using a typical current price of $20 per CER, project developers will sell around $36 billion worth of CDM credits over the next five years.[11]

The "Kyoto gap" for Europe and Japan – the difference between their Kyoto pollution reduction commitments and what they would otherwise have been expected to emit between 2008 and 2012 – is around three billion tonnes of carbon dioxide.[12] Adding the CER supply to the (much smaller) number of credits from the Kyoto "Joint Implementation" projects in central and eastern Europe gives a total of almost two billion offsets. This implies that around two-thirds of the emission-reduction obligations of the key developed countries which ratified Kyoto could be met through buying offsets rather than heading their economies down the difficult, but essential, road of decarbonization.

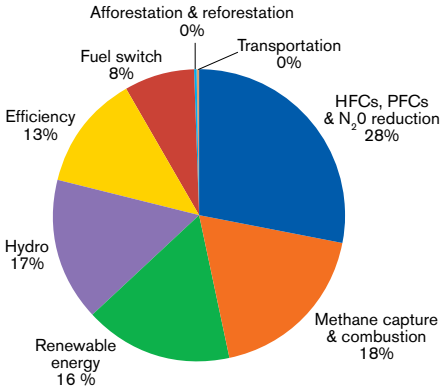
The CDM announced the approval ("registration" in CDM jargon) of its 1,000th project on April 15, 2008. More than twice as many are making their way through the complex approvals process. Once a project is registered it must apply periodically to be issued with CERs based on how many tonnes of emissions it supposedly avoided since it last received credits.

The only power-generation technology that is for now excluded by the CDM's rules is nuclear power.[13] Otherwise any type of project can apply for credits. This means that fossil fuel technologies that claim to be a marginal improvement upon past practices can receive offset income (even though technological advancement means that a power plant entering construction today can be expected to be more efficient than one built five or ten years ago, regardless of offset programs). Meanwhile the CDM has so far been of almost no use to emerging technologies such as solar power, which may deliver major cuts in emissions but are currently considerably more expensive than (heavily subsidized) fossil fuels. Offset income is with few exceptions insufficient to make solar projects profitable.

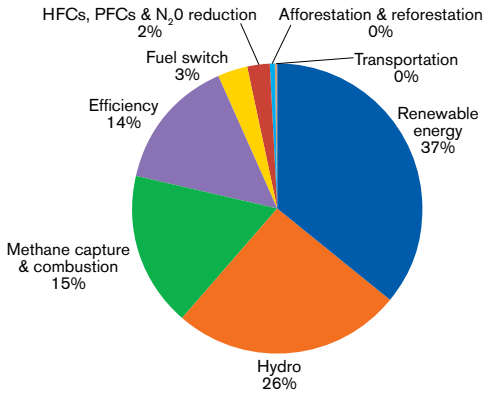
Hydropower is the most common technology in the CDM pipeline, with 828 projects as of April 2008 – more than a quarter of all projects. Biomass is the second most common project type, followed by wind power. Non-hydro renewables together make up 36% of CDM projects. Only 16 solar power projects – less than 0.5% of the project pipeline – have applied for CDM approval. Demand-side energy efficiency measures, although a top priority in the fight against climate change, make up just one in every 20 projects.

Non-hydro renewable projects tend to be smaller than other project types and so each renewable project generates relatively few CERs. The proportion of offset funding going to renewables is thus much smaller than the percentage of renewables projects would suggest (see pie charts, page 5). Many observers had originally hoped that the CDM would primarily be a mechanism for promoting funding in emerging renewables and energy efficiency. Yet if all projects currently in the pipeline generate the CERs

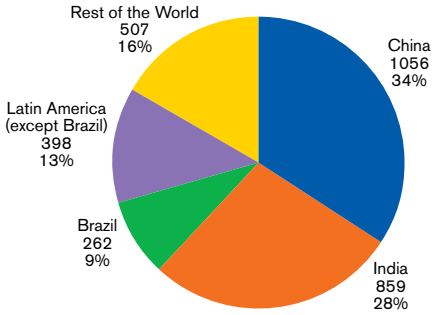
ANNUAL CDM OFFSETS GENERATED BY PROJECT TYPE



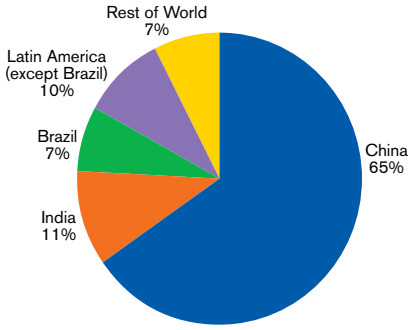
PROJECTS IN THE CDM PIPELINE BY TYPE



PROJECTS IN CDM PIPELINE BY COUNTRY/REGION



CDM HYDRO PROJECTS BY COUNTRY/REGION



they are applying for up to 2012, non-hydro renewables would attract less than one-sixth of CDM funds, and demand-side efficiency just 1%. Dams would attract 14%, of which four-fifths would go to large hydro (see Fast Facts, page 24).[14]

Just over half of CDM funding up to 2012 is currently slated to go to projects that reduce emissions of greenhouse gases other than carbon dioxide. These gases are much more potent at trapping heat than CO_2, so each tonne of them abated can generate multiple CERs. These projects mainly involve fitting pollution control equipment at factories, and capturing methane from coal mines and landfills. On the surface these projects appear to have a climate benefit and to be "additional." However, at least some of the industrial gas CDM projects have proven an incredibly expensive method to achieve their desired emission reductions.

The single project type slated to generate the most CERs is the destruction of HFC-23 (trifluoromethane), one of the most potent of all greenhouse gases. Half of all CERs issued up to March 2008 had come from HFC-23 projects. HFC-23 is a by-product from the manufacture of the refrigerant HCFC-22, an alternative to the notorious ozone-destroying CFCs. Although less harmful than CFCs, HCFC-22 still depletes ozone, and so is being slowly phased out under the Montreal Protocol, the ozone protection treaty.[15]

Every molecule of HFC-23 causes 11,700 times more global warming than a molecule of CO_2. Because of this massive "global warming potential," chemical companies can earn almost twice as much from selling CERs as from selling refrigerant gases. Analysts fear that HCFC-22 factories may be increasing their output solely to produce more waste gases. If this is happening, it will have increased greenhouse gas emissions not only because of generating large numbers of fake offsets to be used by industrialized country polluters, but also because HCFC-22 is itself a potent greenhouse gas.[16]

All the existing HCFC-22 producers in developing countries are thought to have applied for CERs. The concern now is that new HCFC-22 factories could be built merely to produce and then destroy HFC-23. China is pushing hard within the climate negotiations for new HCFC-22 facilities to be eligible to sell CERs.

Michael Wara, at Stanford University's Law School, estimated in 2006 that the HFC projects then in the CDM pipeline would generate €4.7 billion in pre-tax revenues for refrigerant manufacturers, mostly in China and India. According to Wara, destroying the gases will cost less than €100 million. Therefore, through the supposedly efficient market mechanism of the CDM, the European and Japanese taxpayers and consumers who are ultimately paying for the CERs will spend 47 times more than it will cost the companies to stop venting the gas![17] Meanwhile €14.6 billion which could have paid for effective decarbonization

Offsetting US Climate Action

President Bush's withdrawal from Kyoto excluded the US from the CDM. However, emerging federal and state-level carbon trading systems could drive up future demand for CDM offsets. The Lieberman-Warner Act, the most likely climate bill to pass the US Senate, allows 15% of emission reduction obligations to be met through buying international carbon allowances. Investment bank JP Morgan estimates that Lieberman-Warner could create an annual demand for up to one billion allowances from outside the US.

The language in the current version of Lieberman-Warner would not allow the use of carbon permits from countries without emission caps, and so would exclude the direct use of CDM offsets. The bill could, however, substantially increase demand for CDM offsets. The main source for international permits for the US would be the EU's Emission Trading System (ETS). But CDM credits are valid within the ETS – and most of the emission reductions this system is supposed to achieve will likely be met by buying CDM credits. So if the US buys up ETS permits, it will increase European demand for CDM offsets.

The Regional Greenhouse Gas Initiative, a cap-and-trade system covering the power sector in 10 northeastern states, allows CDM offsets to be used for 10% of compliance requirements once carbon allowances exceed $10 per tonne. It comes into force in January 2009. The rules for California's trading scheme are still being developed. An official "Market Advisory Committee" recommended in 2007 that there should be no limit on the quantity of international offsets used in California.

projects is effectively being given away mainly to increase the profits of a handful of chemical companies.

CDM analysts generally assume that all of the industrial gas and methane projects are additional. There is no reason to zap HFC-23 in the absence of offset income, it is perceived, so these projects cannot be business-as-usual. But from a broader perspective, it is not so clear-cut. If the CDM did not exist, or did not grant credits to HFC-23 projects, would it not have been possible to set up a fund to destroy the gases – say, under the UN Environment Programme or the UN/World Bank Global Environment Facility? The gases could have been dealt with at a tiny fraction of the cost of doing this through the CDM. Or governments might have passed laws forcing their chemical companies to destroy the gases. But the CDM creates a perverse incentive not to pass laws or launch programs to destroy this nasty gas. If its destruction is already encouraged or required, then projects to destroy it could be ruled as non-additional and so ineligible for the CDM.

In September 2007 the CDM's governing Executive Board decided that "supercritical" coal-combustion plants should be able to receive CERs. While supercritical technology is more efficient than old-fashioned coal plants, it is by no means a prohibitively expensive or radically new technology that can only be built with help from the CDM. Already by 2004, half of all orders for coal-fired plants in China were for supercritical units.[18]

India's first application for supercritical CERs will likely be for a massive 4,000 MW supercritical coal plant on the coast of Gujarat. The power plant (appropriately named the Tata Ultra Mega project) will spew into the atmosphere 26 million tons of CO_2 per year for at least 25 years.[19] It will be India's third, and the world's sixteenth, largest source of CO_2 emissions.[20]

Tata Power Company claims that its plant should be eligible for CER income because "no super-critical power plant is yet operational in India." Yet several other private sector supercritical plants are already under construction or planned in the country.[21] David Wheeler, a Senior Fellow at the Center for Global Development in Washington, DC, and former World Bank economist, says that "[i]nstead of supporting critical zero-emissions energy investments, scarce international resources are sweetening a private-sector project that will emit over 700 million tons of CO_2 during its operating life."[22]

ADDITIONALITY: REWARDING "GOOD STORYTELLERS" OVER GOOD PROJECTS

While some of the CDM's flaws could be fixed given the political will, the unprovable nature of counterfactual baselines and of project additionality are inherent to the design of the mechanism. They cannot be fixed while the CDM remains a project-based baseline-and-credit system.

It cannot be definitively proven that if a developer or factory owner did not get offset income they would not build their project or switch their fuel supply – and would not do so over the decade for which projects can sell offsets.[23] What if Windfarms 'R Us claims they won't build their project

without offset income because they can't compete with coal plants, but a year later coal prices shoot up, the government decides to give tax credits to wind farms, and suddenly wind is attractive to investors?

Likewise there is no way to know for the coming decade what the emissions would be from, for example, the power sector if a CDM electricity project were not built. If Windfarms 'R Us hadn't built their project, would MegaCarbon Corp. have sold more coal-fueled power, or would Standard Wind have gone forward with their project instead?

The lobby group for the carbon trading industry, the International Emissions Trading Association, has itself stated that proving the intent of developers applying for the CDM "is an almost impossible task."[24] Other industry representatives have complained that "good story-tellers" can get a project approved "while bad story-tellers may fail even if the project is really additional."[25]

No doubt many of the hundreds of non-hydro renewable energy projects in the CDM pipeline are good projects, and exactly the type of thing environmentalists want to see promoted to protect the climate. Yet probably very few of them are additional.

Power projects produce an income stream from electricity sales, and efficiency projects save money. The extra income these projects can earn from the CDM tends to be small in comparison to normal project revenue and unlikely to be high enough to convert an uneconomic or marginal project into a clearly attractive one. And developers and their bankers and investors are taking a major gamble if their profit depends upon their project getting approved by the CDM. What if their application suffers the long delays common to the labyrinthine CDM approvals process? What if they never make it through the process? What if they are not issued as many CERs as requested? (Projects have on average been issued with 15% fewer CERs than forecast for reasons including construction delays and lower than expected power generation).[26]

Perhaps the biggest risk to an investor in a CDM project is that CERs may become worthless after the first phase of Kyoto expires at the end of 2012. If the ongoing international negotiations on the next phase of Kyoto fail to reach agreement in time to have a new treaty in force by 2013, then there will be no reason to buy CERs after 2012. The financial feasibility calculations used to prove project additionality to the CDM are all based on at least 10 and as many as 21 years of CER income. It is doubtful that any renewables projects could receive enough CER income by 2012 to make a significant difference to their long-term financial attractiveness.

Implementing power projects is complex and expensive, and requires high up-front costs for feasibility studies, negotiating financial support, and overcoming regulatory hurdles. It is very unlikely that developers (and bankers) would commit resources to a project if their only chance of turning an acceptable profit is to get their project approved by the CDM in a timely manner *and* for the governments of the world to agree on a post-2012 climate treaty that allows use of CERs.

In a report prepared for the conservation group WWF, Lambert Schneider of Germany's Institute for Applied Ecology estimates that about 40% of the projects (and 20% of the CERs) registered by the CDM by mid-2007 were of "unlikely or at least questionable" additionality. The estimate uses the generous assumption that almost all the HFC and other non-CO_2 projects, and half of the renewables, hydro, natural gas and other power generation projects, are additional. His methodology also makes the assumption that developers are not manipulating the financial data they give in project applications (see below for why this is a dubious assumption).

David Victor, head of Stanford's Energy and Sustainable Development Program, is far more pessimistic. Victor told a recent electrical industry conference in Washington, DC, that he estimates "between a third and two thirds" of CDM offsets do not represent actual emission cuts.[27]

One glaring signal that many of the projects being registered by the CDM's Executive Board are non-additional is that almost three-quarters of registered projects were already complete at the time of approval.[28] It would seem clear that a project that is already built cannot need extra income in order to be built. However, things are not so straightforward in the counterfactual world of the CDM. Developers of completed projects often argue that the expectation of CER income was important for their original decision to go forward with the project. Such a claim is rarely if ever provable, but as its record of approving completed projects shows, this assertion is regularly accepted by the Executive Board.

Several carbon consultants have told this author off-the-record that they tell their clients not to develop renewable energy projects if they actually *need* CDM income, because there is too much risk that they may get caught in the CDM bureaucracy and never – or only after a long delay – receive the quantity of offsets they have applied for. Better, the consultants tell their clients, to apply for credits for projects that stand to make a profit on their own, and let the carbon consultants

One estimate reveals that between a third and two-thirds of CDM offsets do not represent actual emission cuts.

make up the additionality stories needed to get the project approved. A survey of business, NGO and government CDM insiders done for the German environment ministry backs up this admittedly anecdotal evidence. The survey found that 86% of participants agree with the statement "in many cases, carbon revenues are the icing on the cake, but are not decisive for the investment decision."[29]

The experience of International Rivers consultant Barbara Haya at a carbon markets conference in Mumbai shows how the CDM is "working" for industry insiders:

"Lenders agreed openly that they do not lend to projects that are not good investments on their own, without the CDM. The risks associated with CER generation are too high for them to be taken into account in lending decisions. Heads nodded knowingly around the room in agreement that [rate of return] numbers can be manipulated and board minutes showing that the CDM was considered in early stages of project development can be forged. One carbon buyer in the audience criticized a panelist for saying that it is possible to prove the additionality of just about any project. The buyer said he could agree to that statement if they were chatting at a bar, but that the panelist should not make such statements in a public forum."[30]

When the CDM approves non-additional projects, even for climate-friendly renewables projects, the CDM is not helping reduce emissions in the developing world because the projects would have happened anyway. And because industrialized countries can use the CDM offsets to emit more than they committed to under Kyoto, the net result is an increase in global emissions. Renewables and other technologies and practices need subsidies and other forms of support – but the CDM is a particularly expensive and ineffective means of providing this assistance.

The CDM's additionality requirement creates perverse incentives to keep bad practices such flaring methane at landfills.

Additionality also creates perverse incentives for developing country governments not to adopt (or enforce) climate-friendly legislation. Why should a government voluntarily act to cap methane from its landfills or encourage energy efficiency if in doing so it makes these activities "business-as-usual" and therefore not additional and not eligible for CDM income?

BECAUSE WE SAY SO

In the absence of an accurate mind-reading device to expose the true intentions of a project developer, the CDM has developed rules and norms to test the likelihood that a project is additional. The most commonly used "additionality tool" uses three main additionality indicators:

- an *investment* analysis (does CER income improve the project's financial attractiveness compared to at least one other project or boost its rate of return beyond the benchmark considered acceptable by its developer);
- a *barrier* analysis (what barriers prevent a project going forward without CDM support); and
- a *common practice* analysis (projects must show they are not common practice in their region).

The problem with these indicators is that rate of return numbers can easily be manipulated, every project – whether dependent on the CDM or not – has to overcome barriers, and "common practice" is weakly defined.

Axel Michaelowa, a leading CDM analyst, has shown various tricks used by developers and their consultants to understate project profitability without CER income, and so exaggerate the impact of CDM registration on project viability. One trick, used in the applications (called Project Design Documents, or PDDs) for three Indian wind power projects, is to ignore the lucrative tax breaks the projects have received.[31]

Another scam, used by many hydro developers in China, is to understate the amount of power their projects will generate. Michaelowa cites the example of a project involving two small hydros in Jiangxi province.[32] The PDD for this project states that it would have a plant load factor (equivalent to the proportion of time it can operate at full capacity) of only 21%, giving a very unattractive rate of return for the hydros of around 5%.

A typical hydropower load factor is around 50%. Michaelowa re-ran the numbers for the Jiangxi projects giving them a load factor of 42% (double the value cited in their PDD, but still low by normal standards). At this load factor, their rates of return soared to 18% for one plant, and 33% (an exceptionally high value) for the other. With these expected profits, both projects should fail the investment additionality

test.[33] As of March 1, 2008, the CDM project pipeline contained 82 hydro plants in China with a load factor below 40% and seven with a load factor below 30%.[34]

There is sometimes an illuminating contrast between the assessment of project viability in CDM applications (i.e., only attractive with CER income) and that in other project-related documentation (i.e., very attractive project on its own merits). An excellent example is the Xiaogushan hydro project, built inside a national nature reserve in Gansu province, China.

> Most European governments and Japan are betting on a plentiful supply of cheap CERs that they can use to meet their Kyoto goals without having to take too many potentially politically difficult actions at home.

The Asian Development Bank's report justifying its loan for Xiaogushan in 2003 states that it is the cheapest option for generation expansion in Gansu, regardless of CER income, and a priority for the local and provincial governments. In contrast, the PDD submitted to the CDM by the World Bank two years later asserts that the project is very risky. Without CDM support, the PDD states, "it would not have been able to reach financial closure, mitigate the high project risk, and commence the project construction." This was written two years after project construction commenced without CDM support.[35] The Executive Board approved Xiaogushan to receive credits in August 2006.

Another classic of this genre is the highly controversial Bujagali Dam in Uganda. Bujagali was promoted for years by the Ugandan government, World Bank and AES, the US power company that then held the concession for the project, on the grounds that it was the country's cheapest and best option for power expansion. Then suddenly in 2002, AES submitted a PDD claiming that the project was not viable without CER income and that actually fossil fuel plants were the most attractive options for Uganda.[36] AES later dropped out of the project and their CDM application was shelved. The dam is now being built by a new group of developers with funding from the World Bank, who justified their loans in 2007 by again calling the project the "least cost" power expansion option for Uganda.[37] And again the developers are reported to be intending to apply for CERs (and presumably will do a flip-flop in their application and claim that their dam is actually an economic loser).

The "barrier analysis" is the most frequently used, and abused, additionality indicator. Lambert Schneider says that the use of barrier analysis is "highly subjective, vague and difficult to validate in an objective and transparent manner … In many PDDs, the barriers provided are not credible, frequently no evidence for the barriers is provided and it is often not clear whether and how the CDM had any affect on the barrier."[38]

One great example of non-credibility is given in the PDD for the Tata Ultra Mega: this says that one barrier the CDM will help overcome is that the project's coal supply will be offloaded at a jetty, which is not yet built and so may be delayed. "Moreover, once the jetty is ready, the jetty will always be exposed to the vagaries of the sea and resultant disruption in operations of the same." It is not explained how CDM income going to the power plant operators will force the jetty contractors to stick to their completion date, or how the CDM will still the ocean waves.

Barrier claims used for hydro projects include: the dam is in a remote region; the dam ran into financial problems during construction; the dam is built by a small private company with difficulty accessing financing, and the dam is the largest in the region. While each of these claims might be true, how can it be known that these are reasons why a project would not have gone forward without the CDM? All projects have barriers, and countless dams have overcome the barriers listed above without assistance from the CDM.

Developers and consultants have come up with similarly absurd arguments to prove they are not "common practice." Arguments used in PDDs for hydro projects include: the dam is being built in a new regulatory environment due to power-sector restructuring; the project is being built by a small private firm, whereas previously the state developed dams; and the best hydro resources have already been exploited and now only less attractive locations are available. Almost any project can be shown to not be common practice if allowed to use such a range of definitions.

A SETBACK FOR SUSTAINABLE DEVELOPMENT

The promotion of sustainable development in developing countries is, under the Kyoto Protocol, supposed to be as important for the CDM as providing "emission reductions." In reality, the CER market cares only about generating cheap offsets. Projects with strong poverty alleviation and local environmental benefits, which may need relatively high CER prices to be viable, are a tiny part of the CDM pipeline.

The academic journal *Climatic Change* devoted part of a special issue in 2007 to investigating whether the CDM was delivering on its sustainable development mandate. The conclusion was a resounding no.[39] Carbon trading consultants Christoph Sutter and Juan Carlos Parreño assessed the first 16 projects registered by the CDM and found only four with a high sustainability rating. Because these four were all small projects, they represented less than 1% of the total offsets from the 16 projects. Sutter and Parreño believe that

none of the highly rated projects are additional, meaning that there was not a single project in this batch that fulfilled both of the CDM's twin objectives.[40] Other researchers found negligible benefits for poor communities from the CDM in India and Brazilian Amazonia.[41]

The CDM is in fact structurally incapable of channeling investments to the most needy. The world's poorest people pollute very little. Where emissions are low, so are opportunities for offsetting them. Very poor countries also face significant barriers in terms of their lack of bureaucratic structures to manage the CDM process, and a lack of trained personnel to handle the Byzantine project-approval process.

Middle-income countries therefore corner the great majority of offset income. As of March 1, 2008, 95% of funds from CER sales had gone to just eight middle-income countries (China, India, South Korea, Brazil, Mexico, Chile, Egypt and Malaysia). Sub-Saharan Africa has so far not been issued a single CER.

The fact that large hydro is the second most common project type in the CDM itself strongly suggests that the mechanism is not structured to promote local environmental protection and poverty alleviation. This is not to say that the CDM has yet promoted the destruction of rivers and large-scale displacement of riverside dwellers – because most, if not all, of the hydros are likely non-additional, few, if any, new dams have so far been built just because of the CDM. The main impact of the CDM on the hydropower sector so far has been to transfer around $57 million from European and Japanese taxpayers and consumers into the hands of hydro developers in China and Latin America. If all the projects in the CDM pipeline end up being registered and issued the credits that they claim, hydro developers, mostly in China, would rake in around $1.5 billion per year (minus taxes and fees to carbon brokers and consultants who write and certify project applications).[42]

The only condition the Executive Board currently sets on hydro projects is that they cannot have very large reservoirs relative to their generating capacity, an indicator of high methane emissions from rotting biomass in the reservoir.[43] This condition would not stop dams with large reservoirs applying for CERs as long as they also had large generating capacities. Even Three Gorges Dam, by far the world's largest hydropower plant, would be eligible to apply for CERs. Given the proven inability of the CDM system to weed out fraud, it is not unlikely that hydro developers understate the size of reservoirs in their PDDs. If they do, it is very unlikely they will ever get caught.

The one place in the broader CDM system where safeguard criteria are applied to hydro projects is in the European Union's Emissions Trading System (ETS). An EU law called the Linking Directive allows European polluters covered by the ETS to buy CDM offsets instead of cutting their emissions. The directive sets some conditions on the use of CERs in the ETS, including that credits from hydros with a capacity greater than 20 megawatts can only be used if the projects comply with the recommendations of the World Commission on Dams (WCD).

The WCD found that large dams had an atrocious record of harming local communities and ecosystems, and fell badly short on providing promised benefits. The commission developed a stringent set of conditions for dam planning and implementation designed to weed out bad projects and improve those dams which do get built. Although the Linking Directive passed in 2004, EU member states have only recently started to clarify how they will judge WCD compliance. Unfortunately, it appears that the job of assessing compliance will be given to either the project developer (the position of the Dutch and UK governments) or one of the CDM-accredited certification companies (the German position).

A project developer's assessment of their own project will be as reliable as George Bush's assessment of the wisdom of invading Iraq. But having a certification company do the job is unlikely to be much better. The certification companies accredited by the CDM are known as Designated Operational Entities (DOEs). It is the DOEs that are supposed to "validate" projects for the CDM – that is, assess whether they comply with the CDM rules such as additionality. Three companies dominate the validation process – Det Norske Veritas, based in Norway, TÜV SÜD from Germany, and the Swiss SGS Group. DOEs have repeatedly shown themselves willing to rubberstamp project documents containing unverifiable and highly dubious claims.

A sign that we can expect similar whitewashing on the WCD has already been given by one of the first WCD compliance reports. The report for the Yiyang Xiushan project in China by TÜV SÜD approves the dam on the basis of a laughably poor assessment. The authors appear to lack any informed knowledge of the numerous environmental and social impacts of dams. TÜV SÜD claims that the 65 MW dam has "no negative impact on the river, the livelihood and the environment in general" and only positive impacts "such as on irrigation of trees with big leaves."[44]

EXPLAINING THE FAILURE

There are various reasons why the CDM is failing so comprehensively. The inherently unsolvable problems of additionality and baselines were explained above. But there are also a series of bureaucratic and political reasons for the CDM fiasco, in particular the incompetence, and conflicts of interest of the validators.

When the CDM was designed it was conceived that the DOEs would rigorously audit projects during the validation process. Projects judged to have met the CDM criteria by validators would be submitted to the Executive Board, which would approve them more or less by default. But

Women affected by Allain Duhangan Dam protest the project at the public hearing, 2004. The dam received CDM credits years after the World Bank approved the project. Photo: SANDRP

the validators have failed miserably to play their supposed role as competent, independent and objective auditors. The validators act as project facilitators, even advocates, rather than auditors.[45]

International Rivers has closely monitored hydropower projects applying for CDM credits since 2002. We and other colleagues have submitted comments to the DOEs criticizing additionality determinations and other aspects on at least 27 dams. Our documentation shows that PDDs are frequently marred by misleading and sometimes absurd claims.[46]

Part of the validators' contractual responsibility is to take public comments into account when reviewing project applications. Yet we, and others who have submitted comments, have seen many of our submissions rejected or just ignored. Only the most minor of the comments we have made – for example, when we have pointed out small inconsistencies in data within PDDs – have been clearly acted upon.

Other analysts following the CDM have commented on the validators' serious shortcomings. The CDM's own experts commented in 2006 that the "available documentation provides little evidence of external validation by DOEs of key assumptions and data used for additionality assessment…"[47] Lambert Schneider has found that validation reports frequently note the need to correct formal bureaucratic requirements (such as missing approval letters, or wrongly completed tables), but very rarely ask for any action to be taken on the demonstration of additionality.[48]

One key reason for the DOEs' abysmal record is that the validators are selected and paid by project developers. The developers, not surprisingly, seek low costs, a speedy process, and DOEs with a track record of giving positive validations. Some developers even refuse to pay the validators if they do not give the thumbs up to their projects. This puts obvious pressure on DOEs to minimize the time they spend on validation and verification, cut costs by using few and inexperienced staff, and, as Lambert Schneider notes, "be more 'flexible' in the interpretation of the requirements."[49]

Another part of the explanation why DOEs do not act as strict, independent auditors is that they are in the same game as the developers. Validators, developers, carbon buyers and brokers are all members of the International Emissions Trading Association (IETA). All have financial interests in a large and growing offsets market, which depends upon a steady stream of new project applications and a lax approvals process. And all lobby the Executive Board, and the governments that are represented on it, to keep the offset flow coming. IETA reportedly had 300 delegates at the 2007 climate negotiations in Bali,[50] forming a powerful, well-resourced lobbying bloc with excellent access to government negotiators.

The pressure on the Executive Board to turn up the CER spigot comes not just from the corporations that make up IETA. Most European governments and Japan are betting on a plentiful supply of cheap CERs that they can use to meet their Kyoto goals without having to take too many potentially politically difficult actions at home. Governments of the large developing countries are happy with lax CDM requirements because this increases the CDM revenue that can be captured by their companies and, through taxation, their exchequers.

The impact of these various political pressures can be seen in the Board's record of rubber-stamping projects. As of March 1, 2008, the Executive Board had rejected only 59 of the more than 1,000 projects submitted for registration. And according to Axel Michaelowa, the Board is much more likely to reject small non-additional projects than large ones. Michaelowa looked in detail at 52 registered projects in India and concluded: "Small fish are caught while big sharks escape."[51]

Over the past year, the CDM secretariat in Bonn, Germany, has greatly boosted its number of staff, largely in response to complaints from environmentalists that the CDM lacked capacity to weed out non-additional projects, and from carbon marketers that the approvals process was too slow. This increased capacity to review project applications has led the rejection rate to jump to 11-12% so far in 2008.[52] While this is very welcome, the Executive Board is still approving the great majority of non-additional

CDM's Hydro Hall of Shame

By Barbara Haya

Allain Duhangan Dam, India, 192 MW
The CDM application for this project states that the World Bank only financed it because of the expectation of CDM income. Yet the World Bank approved its funds for Allain Duhangan in October 2004, before the Kyoto Protocol entered into force, before any CDM projects had been registered, and before there was any certainty that carbon credits would have value. The dam's social and environmental impact assessment report from 2003 states that the project was one of the cheapest options for power generation in India's northern region. It is not credible that the World Bank funded this project only because they anticipated they might one day get income from the CDM. Local people and NGOs in India found that some of the most important impacts of the project were left unacknowledged in the environmental and social impact assessment and mitigation planning. Local people opposed the project as it diverts the Duhangan River to another river. The project developer has been found in violation of India's environmental laws scores of times

Approved by the CDM May 2007. Validator: Det Norske Veritas. Italy is buying the offsets through the Italian Carbon Fund at the World Bank.

Jorethang Loop Dam, India, 96 MW
Public consultation with individuals directly affected by proposed CDM projects is a requirement for CDM registration, but these consultations are often not taken seriously. An Indian NGO visited villages directly affected by the Jorethang Loop hydropower project right after its public hearing and found many villagers were unaware of the hearing and of basic aspects of the project. The community and NGOs requested the project's environmental impact assessment and other project documents, but were ignored by the developer. The developer claimed that hydropower is not common practice in India, although it accounts for a quarter of total power generation – higher than the world average.

Approved by the CDM February 2008. Validator: Det Norske Veritas.

Tala Dam, Bhutan, 1,020 MW
This massive hydro project, built in Bhutan to supply electricity to India, started construction in October 1996 before the CDM even existed on paper. In December 2007, eight months after all units were up and running, it entered the CDM approval process. Tala's application argues that: "The project proponents … look up to CDM revenue to provide necessary coverage to any loss arising out of any unexpected difficulties during implementation and operation of the project activity." In other words, the developers are saying they should be able to sell offsets to help them pay for their cost overruns. As almost all large dams suffer large cost overruns, if the CDM approves Tala it would logically mean that any hydro project, whether it is already built, under construction, or planned, should be eligible to sell offsets.

In the validation stage since December 2007. Validator: Det Norske Veritas.

Campos Novos Dam, Brazil, 880 MW
This 880 MW hydro project has become a symbol of the human rights abuses inflicted on communities affected by large dams in Brazil. The dam displaced 3,000 people, many of whom have not received promised compensation. Protests against the project were met with police violence. Construction on the dam started in 2001 and was completed in 2005. In June 2006 a diversion tunnel collapsed, causing an uncontrolled release of water that emptied the dam's reservoir. After extensive remedial works, it began generating electricity in May 2007. Eight months later the project applied for the CDM, arguing that it was "not a feasible alternative" to build the dam without CDM income, despite the fact that the dam was already built without CDM income.

In the validation stage since November 2007. Validator: Det Norske Veritas.

Sondu Miriu Dam, Kenya, 60 MW
This project's impacts include displacement of more than 1,000 households, diversion of the main water source for 1,500 households, eye and respiratory problems from construction dust, and harm to fisheries. Construction of Sondu Miriu started in 1999, more than five years before the Kyoto Protocol entered into force. An activist campaign to raise awareness of the social and environmental impacts of this project resulted in the shooting and arrest of Kenyan activist Argwings Odera by the police.

In the validation stage since July 2007. Validator: Det Norske Veritas

projects that go before it. As noted above, the changing mix of project types means the proportion of non-additional projects applying for registration is likely increasing.

The validators themselves have also noted that project developers are improving their understanding of the CDM system and so their ability to successfully scam it. Werner Betzenbichler of TÜV-SÜD told the *Wall Street Journal* in April 2008 that developers are "getting more inventive, so it's getting harder to detect the black sheep."

REFORM AND REPLACEMENT

Clearly the CDM cannot go on with business-as-usual. If we want to sustain public support for global action on climate change we cannot risk one of its central planks being a mechanism that is based on lies and spurious assumptions. The CDM is now well established and will not be scrapped overnight. The short-term priority therefore must be for governments and the Executive Board to introduce meaningful reforms. These include:

- Project developers should not hire validators. This conflict of interest would be mitigated if the UN hired validators and randomly assigned them to each project.
- The Executive Board should cancel the accreditation of validators who fail to apply the CDM's rules.
- The Executive Board should create a set of mandatory guidelines for validators to use when assessing additionality. The "barriers" test should not be allowed. Clear definitions are needed for "common practice" and how to determine financial benchmarks. In many countries where hydropower is already a substantial portion of grid capacity and of annual capacity additions, such as in China, hydropower should be considered common practice.
- As proposed by Lambert Schneider, projects should not be eligible for registration if they started more than one year before submitting a PDD.[53]
- As proposed by Environmental Defense, CERs should be discounted by both buyers and the Executive Board. What this means is that a percentage of CERs from any project would be retired and not used for Kyoto compliance purposes. Such a measure would turn the CDM from a zero-sum mechanism at best, where an emission supposedly reduced in one location causes an equal increase in emissions elsewhere, to one where an additional project would actually lead to a net reduction in emissions.[54]
- Industrial gas projects with no sustainable development benefits should be excluded from the CDM. It should be much cheaper to do these projects through a fund, for example managed by the World Bank/UN Global Environment Facility.
- Projects should be required to meet international social and environmental standards. Hydro projects should be required to comply with the recommendations of the World Commission on Dams.
- The CDM should adopt for all projects the WCD standards for stakeholder consultations, including project acceptance by affected people based on a clear understanding of project impacts.

To have a reasonably high likelihood of preventing catastrophic climate change, the latest climate science shows that we must almost totally decarbonize the global economy by the middle of this century. Achieving these radically deep cuts will require substantial and effective financial support and technology assistance to developing countries. Many analysts have proposed an expanded CDM as the primary mechanism for providing such support in the successor to the first phase of the Kyoto Protocol.

Increasing the size of the CDM will only exacerbate its problems. It must be scrapped in anything like its present form. It is particularly necessary to eliminate the need to prove additionality on a project-by-project basis, which is ultimately impossible to do with any substantial degree of accuracy. Financial transfers to developing countries will need to be mainly based on traditional fund-type systems, potentially funded from carbon taxes and the auctions of emission permits under cap-and-trade schemes. Offsets cannot have a significant role in a meaningful global climate treaty. We tried them, we've discovered they don't work, now its time to move on.

Patrick McCully is the executive director of International Rivers Network, and the author of *Silenced Rivers: The Ecology and Politics of Large Dams.*

NOTES

1 Kyoto establishes three trading schemes known as the "flexible mechanisms." The CDM is the most important of these by far in terms of market size. The other two schemes, "Joint Implementation" and "emissions trading" allow countries with Kyoto targets to trade emissions allowances and invest in low-carbon projects in other countries with Kyoto targets.

2 "Stanford Study May Stir Debate On Limiting Costs In Climate Bills," Carbon Control News (carboncontrolnews.com). Posted March 7, 2008.

3 See e.g. Yvo de Boer, Executive Secretary, UNFCCC, Speaking notes for key note address, Carbon Market Insights 2008, Copenhagen, 11 March.

4 "CDM Problems 'temporary,' Carbon Finance, 12 March 2008.

5 de Boer op. cit.

6 See e.g. Oberthür, S. and H. Ott (1999) The Kyoto Protocol: International Climate Policy for the 21st Century. Springer, Berlin.

7 See e.g. Burtraw, D. (2000) "Innovation Under the Tradable Sulfur Dioxide Emission Permits Program in the US Electricity Sector." Resources for the Future, Washington, DC. For critical perspectives on the comparative effectiveness of the SO_2 trading scheme see e.g. Lohmann, L. (2006) "Carbon Trading: a critical conversation on climate change, privatization and power," Development Dialogue 48, September, pp.108-109; Lipow, G. (2007) "Emissions trading: A mixed record, with plenty of failures. Regulations work better," Gristmill Blog, 19 February).

8 Bell, R.G. (2006) "Market Failure," Environmental Forum, March/April.

9 Davies, N. (2007) "The inconvenient truth about the carbon offset industry," The Guardian, 16 June 2007.

10 UNEP Risoe CDM/JI Pipeline Analysis and Database (http://cdmpipeline.org/overview.htm, accessed 21 March 2008).

11 CERs are priced in Euros so their dollar cost has risen sharply with the slump in the value of the dollar. CER prices have recently ranged from $16-$24.

12 Ahmad, I. (2008) "EU ETS – Phase 2 & Beyond." Presentation at conference "Emerging Opportunities in Carbon Markets," Miami, 17 January 2008. It is uncertain whether Canada will try to comply with Kyoto, despite its legal obligation to do so. If it does attempt to comply it would likely be a large source of demand for CERs (the country's estimated Kyoto gap is 1bn tonnes).

13 Climate negotiators have also deadlocked over whether carbon capture and storage projects should be eligible for the CDM. Environmentalists and some developing country governments oppose the idea, the EU, Canada, Norway, Japan and OPEC support it (See Rölke, L. (2008) "Enhancing the CDM and JI Mechanisms," JIKO Info 6, 1, January/March).

14 CDM Hydro Spreadsheet, March 2008, developed by Ben Docker for International Rivers (http://internationalrivers.org/node/1785 accessed 21 March 2008). In the CDM "large" projects are those with an installed capacity of more than 15 MW.

15 HCFC-22 production is declining in developed countries, with a total phase-out set for 2020. Developing countries are to stop production by 2030. (Environmental Investigation Agency (2006) "Turning Up the Heat: Linkages between ozone layer depletion and climate change. The urgent case of HCFCs and HFCs." Washington/London, August; Schneider, L. (2007) "Is the CDM Fulfilling its Environmental and Sustainable Development Objectives? An Evaluation of the CDM and Options for Improvement." Report prepared for WWF by Öko-Institut, 5 November).

16 HCFC-22 has a global warming potential 1,700 times that of CO_2.

17 Wara, M. (2007) "Is the Global Carbon Market Working?" *Science* 445, 8 February. Industrialized country HCFC-22 producers have voluntarily committed to stop venting HFC-23. Wara's calculation is based on a (low) CER price of €10.

18 Ricketts, B. (2006) "Focus on Clean Coal." International Energy Agency, November.

19 The Tata Power Company is applying for 3.1 million CERs/year, claiming that this is the gap between the emissions of its Gujarat plant and those from a typical recent Indian "sub-critical" coal plant.

20 Carbon Monitoring for Action (www.carma.org).

21 Wheeler, D. (2008) "Tata Ultra Mega Mistake: The IFC Should Not Get Burned by Coal," Global Development: Views from the Center blog, posted March 12).

22 Wheeler, D. (2008) "CARMA Watch: Red Light for The World Bank Group on Coal-Fired Power," Global Development: Views from the Center blog, posted January 8. In this case the "scarce resources" come not just from the CDM but also the World Bank's International Finance Corporation which approved a $500m investment in the Tata Ultra Mega in April 2008.

23 The basic "crediting period" under the CDM is 10 years with no possibility for extension. Applicants can also choose a 21-year period with baseline reviews 24 24 Quoted in Schneider (2007) op. cit.

25 Schneider (2007) op. cit.

26 "Performance of Hydropower Projects," IDEAcarbon Sector Insights, December 2007. Some project types have seriously underperformed – e.g., hydro by an average of 25%, wind by 30% and landfill gas projects by 70% ("Wind and hydro CDM projects underperforming by 25-30%: analyst," ***CDM & JI Monitor 6,*** Issue 3, 6 February 2008). Michaelowa believes that the apparent performance of wind and hydro projects is likely to improve markedly due to the trend in recent applications for Chinese projects to underestimate project performance in order to make the CER income appear important for project viability (see e.g. Michaelowa, A. (2007) "Project performance under CDM so far," presentation at Austrian JI/CDM Workshop, January 24, 2008).

27 "Stanford Study May Stir Debate On Limiting Costs In Climate Bills," Carbon Control News (carboncontrolnews.com). Posted March 7, 2008. See also Wara, M.W. and D.G. Victor (2008) "A Realistic Policy on International Carbon offsets," Stanford Uni. Program on Energy and Sustainable Development, Working Paper 74, April.

28 73% of projects registered by 1 March 2008 were complete at registration (Barbara Haya pers. com.).

29 Quoted in Schneider (2007) op. cit.

30 Haya, B. (2007) "Failed Mechanism," International Rivers, Berkeley, November.

31 Michaelowa, A. (2007) "Experience in Evaluation of PDDs, Validation and Verification Reports." Presentation at Austrian JI/CDM workshop. Vienna, 26 January.

32 Project 1524: Changpinghe Yiji and Erji 10.4 MW Bundled Small Hydropower Project (http://cdm.unfccc.int/Projects/DB/DNV-CUK1200480705.0/view).

33 Michaelowa pers. com., 29 March 2008. What is regarded as "financially attractive" varies widely among different developers. In a sample of 93 randomly chosen PDDs the minimum rates of return claimed as acceptable by developers ranged from 4% to 22% (Schneider (2007) op. cit.).

34 Analysis of Risoe data by Michaeolowa.

35 McCully, P. (2005) "Comments on the World Bank PCF CDM Project Design Document for the China Xiaogushan Large Hydro Project." International Rivers Network, Berkeley, 21 August (internationalrivers.org/en/node/1340).

36 Bosshard, P. (2002) "IRN Comments on Bujagali Large Hydro Project." IRN, Berkeley, 19 August 2002 (internationalrivers.org/en/node/1323).

37 "Uganda's Bujagali Hydropower Project Reaches Financial Close," World Bank Press Release December 21, 2007.

38 Schneider (2007) op. cit.

39 Michaelowa, A. and K. Michaelowa (2007) "Does climate policy promote development?" *Climatic Change* 84.

40 Sutter, C. and J.C. Parreño (2007) "Does the current CDM deliver its sustainable development claim? An analysis of officially registered CDM projects," *Climatic Change* 84.

41 Borges da Cunha, K A. Walter and F. Rei (2007) "CDM implementation in Brazil's rural and isolated regions: the Amazonian case," Climatic Change 84; Sirohi, S. (2007) "CDM: Is it a 'win-win' strategy for poverty allevation in rural India," *Climatic Change* 84.

42 74,857,000 CERs at $20 per CER. Data from UNEP Risoe database.

43 See McCully, P. (2006) "Fizzy Science: Loosening the Hydro Industry's Grip on Reservoir Emissions Science." IRN, Berkeley, November.

44 TÜV SÜD (2007) "WCD Compliance Report. Yiyang Xiushan Hydroelectric Project, P.R. China." Munich, 31 August.

45 The DOEs have been approved by the CDM Executive Board both to "validate" projects before they go to the Board, and to "verify" the number of CERs to be issued to projects for each issuance period. Once the DOE gives a positive validation to a project it is then submitted to the Board for registration. The Board automatically accepts requests for registration (or issuance of CERs) unless at least three Board members request a review.

46 http://www.internationalrivers.org/en/cdm_comments/date?page=1

47 Quoted in Schneider (2007) op. cit. p. 24.

48 Based on a sample of 93 Validation Reports (Schneider (2007) op. cit., p.26). The Executive Board itself became concerned about the performance of some DOEs in 2006 and ordered "spot checks" of these companies' competencies and quality control mechanisms. The Board found several serious problems and requested that these be rectified. It was later satisfied that the necessary "corrective actions" had been taken. The lack of any sanctions against the companies sent a signal to all the DOEs that they did not have to fear the Board's disapproval. There was no withdrawal or suspension of the companies' accreditation, not even the release of their names so that they could be publicly identified.

49 Schneider (2007) op. cit. p.20.

50 Bullard, N. and Moraras, B. (2008) "Where's the Heat? An Outsider's View of the Bangkok Climate Talks," Focus on Trade, No. 138, April.

51 Michaelowa, A. (2006) "Introduction to baselines and additionality and structuring of CDM transactions," presentation at National Workshop on Clean and Energy Efficient Technologies for Steel SMEs, New Delhi, Oct. 7. Looking at all registered and rejected projects whether additional or not, the average size of the 59 projects rejected by the Executive Board is only 43% of the average size of the 948 registered projects (data crunching provided by Ben Docker).

52 "Rejection Rate of CDM projects increases," ***CDM & JI Monitor,*** 2 April 2008. Reasons for rejection include numerous forms of non-compliance with the CDM's rules, including non-additionality.

53 Schneider (2007) op. cit. p.10.

54 See e.g. "Making CDM Compatible with 2°C," Environmental Defense briefing paper released at COP13/MOP3 Bali, 3-14 December 2007; "CDM and the Post-2012 Framework," Environmental Defense discussion paper released at UNFCCC AWG/Dialogue, Vienna, 27-31 August 2007.

A Growing Movement to Stop Climate Change

There is no silver bullet that will bring a quick fix to the climate change problem – but a buckshot approach might just blow enough holes in it to make it more manageable. Here we feature just a handful of the many, many good initiatives that are tackling the problem head-on.

A pre-election "Walk for the Climate" in Australia drew tens of thousands in November 2007. These demonstrators were among about 40,000 who took to the streets in Melbourne. Photo: Arsineh Houspian

A POLITICAL SHIFT

It's the Climate, Stupid: Australia's temperatures are rising faster than the global average. Not only is Australia the "canary in the coalmine" for global warming, it also has the biggest per capita carbon footprint of any developed nation in the world. In November, after the worst drought in 100 years brought the crisis home, Australian voters booted climate-change do-nothing John Howard and elected Kevin Rudd to Prime Minister. Rudd campaigned on a platform that includes a 60% cut in CO_2 emissions by 2050, and major investments in geothermal energy and solar power.

High Standards: Because the US federal government has failed to set meaningful national goals for reducing emissions, states are taking the lead. More than half of US states have mandates requiring between 10 and 25 percent of their energy be obtained through renewable sources in a decade or two. Thanks to these "renewables," the US is now second in the world (after Germany) for installed wind power, and first for concentrating solar power. California upped the ante in 2006 by enacting the Global Warming Solutions Act (which commits the state to cut its greenhouse gases 25% by 2020), and a landmark law to regulate emissions from new cars. California's Million Solar Roof Initiative has a goal of 3,000 MW of new solar capacity by 2017.

A TECHNOLOGICAL SHIFT

A Mighty Wind: In 2007, about 33,000 MW of new renewable-energy capacity was added worldwide, including 21,000 MW of new wind power and 2,700 MW of grid-connected solar photovoltaics – a 500% jump from just four years earlier. Wind continues to dominate the scene: as of this writing, the world had about 100,000 MW of wind power. The European Union's 56,535 MW of wind avoids up to 90 million tons of CO_2 in an average wind year, according to Worldwatch. China was the big surprise in new wind additions in 2007: it now ranks fifth, with 6,050 MW, and could have as much as 50,000 MW by 2050.

The Almighty Dollar: Investors are putting their money into clean tech. New global investments in energy technologies – including venture capital, project finance and research and development – have increased 60% percent since 2006, rising to $148.4 billion in 2007, according to *New Energy Finance.*

A Rising Sun: Concentrating solar thermal is experiencing a renaissance, with Spain and the US West leading the way for this highly effective grid-based renewable technology. The California utility Pacific Gas & Electric is spurring a particularly large jump in concentrating solar power (CSP) plants in the US. The utility is committed to buying at least 1,000 MW (enough to power 775,000 homes) from CSP plants in the next five years. Renewable Energy World predicts close to 40,000 MW worldwide by 2025.

A SOCIAL SHIFT

Green buildings movement: Buildings are responsible for almost half of all GHG emissions annually in the US, and suck up 75% of US electricity. Architecture 2030 has devised "the 2030 Blueprint," a plan to greatly reduce the climate change impacts from buildings, save billions of dollars, and create jobs. The plan is for all new buildings and major renovations to reduce their carbon footprint by 50% by 2010, and for new buildings to be carbon neutral by 2030.

Green Jobs movement: A growing worldwide movement is calling for more "green collar jobs" to halt climate change

Continued on page 23

Squaring the Climate Circle

A New Politics of Solidarity Can Heal a Divided Planet

by Tom Athanasiou

The science is in, the debates are over: we face a true climate emergency, and we must set out immediately on a path of dramatic global carbon emissions reductions. We must do so, moreover, despite all the other emergencies now competing for our attention. Further delay will only condemn us to a narrowing future in which worsening impacts fade towards critical tipping points.

The Intergovernmental Panel on Climate Change (IPCC), in its recent Forth Assessment Report, has given us the most authoritative and influential roundup of climate research yet published. It did so with a lagging and even conservative view of the scientific consensus. The latest science (ice melt and carbon cycle science[1] in particular) is more challenging than even the IPCC report would lead us to believe. In response to that challenge, the scientific community is becoming increasing forthright about the concentration targets, emission trajectories, and technology policies that we'll need if we're to rise to the occasion. We know now what we have to do. Our goal has to be the total decarbonization of the global economy, and as quickly as humanly possible.

A crucially important paper was recently published by a team led by NASA's noted climatologist Jim Hansen. It suggests that the continued growth of greenhouse gas emissions, for just another decade, will probably eliminate any remaining possibility of avoiding "catastrophic effects," and that the challenge must therefore be seen in the very strongest terms: "The most difficult task, phase-out over the next 20-25 years of coal use that does not capture CO_2, is Herculean, yet feasible when compared with the efforts that went into World War II."

This, please note, is not merely a call for "no new coal," or even a call for "no new coal that doesn't capture CO_2." It's a call to shut down all coal, everywhere, existing or new, that does not capture CO_2. And 25 years is not a long time. So: what would such an effort entail? Who would pay the cost? Who would pay the cost in the developing world? By what means and via what institutions? And if we were to set out on this path, how would we avoid empowering the nuclear lobby? Or facilitating the damming of every remaining valley and gorge, throughout the world, come what may?

Big questions, these, but there are more as well. Because the climate emergency comes to us on a sharply and bitterly divided planet in which the broad cooperation that's needed is in extremely short supply. In a nutshell: the wealthy and even the middle classes are – at least for now – largely insulated from the consequences of planetary despoliation, while, all around them, billions of impoverished people live out their lives in states of incessant, grinding, daily emergency.

In this context, the international climate negotiations have been able to make only the most achingly slow and inadequate progress. The impasse here bears lengthy analysis, but suffice it to say that, on the one side, the wealthy countries balk at making deep emissions cuts while the developing countries of the South are allowed to proceed without carbon caps of their own. On the other side, southern decision makers feel entirely justified in refusing emissions reduction commitments that they fear will fatally undermine their access to development which, at least

Muir and Riggs Glacier in Glacier Bay National Park in 1941. Photo: William Field, U.S. Geological Survey photo.

Riggs Glacier (and the lack of Muir Glacier) in Glacier Bay National Park in 2004. Photo: Bruce Molnia.

for the moment, is still strongly tied to increased carbon emissions. It's a classic deadlock, in which neither side is willing to make the difficult leap to a low-carbon future.

To break this impasse, large-scale technological progress on low-carbon energy is absolutely necessary. But the climate agenda must also be broadened to encompass the development crisis and, more particularly, the realities of the rich-poor divide. The extremely rapid global emissions reductions that we need are quite impossible without the South's earnest, fully-committed participation, but such a commitment will elude us as long as decarbonization undermines, or even threatens to undermine, the southern development process. In all this, of course, "development" must be redefined. But even more importantly, any climate treaty that does not explicitly protect, and enable, the efforts of the poor and aspiring around the world to escape poverty and achieve a dignified level of material life is doomed to failure. There's no choice between climate protection and human development; we shall have both, or we shall have neither.

The situation is illustrated by Figure 1, which tells a story as simple as it is significant. Think of it as involving a bit of science, a bit of conjecture, and a bit of arithmetic.

The top line is the science. It represents the emergency emissions pathway needed to avoid a global climate catastrophe. The pathway drawn here gives us a reasonable likelihood of keeping total planetary warming below 2°C – the most widely cited threshold of "dangerous climate change." On this pathway – and there's no denying its ambition – global emissions peak by 2020 and then decline 80% by mid-century. Yet even so we would suffer considerable climate risks and a roughly 20-35% probability of overshooting the 2°C line.[3] This trajectory cannot, by any means, be said to be "safe."

The bottom line is conjecture. It's not entirely far-fetched to suppose that the wealthy countries will make extremely ambitious domestic cuts. Thus, the bottom line supposes that all Annex 1 countries – chiefly the US, Canada, Europe, and Russia – manage to reduce their emissions as quickly and as deeply as Al Gore, for example, has called for in the US. It shows a 90% reduction in emissions (below 1990) by 2050 in all those countries, and by so doing it illustrates (as the area under the curve) the still-significant portion of the small remaining global carbon budget that the North would consume even if it were to follow this extremely ambitious course of emissions reductions.

If the North managed such a feat, what would it imply in the South? Here's where we come to the arithmetic, and thus to the middle line, which is produced by subtracting the bottom line from the top. **Thus, the middle line shows how much emissions space would be left for the South.** And it's not much. In fact, to hold this line, the South would need to somehow develop along a path that peaks by 2020, and then begins to decline while its people, on average, are still quite poor. And this is precisely the challenge of climate stabilization in our very bitterly divided world. Because, as things stand today, nothing like this is likely to happen.

These three pathways, taken together, pose the central question of global climate politics: what sort of climate regime can enable this kind of future?

SQUARING THE CIRCLE

"It always seems impossible until it's done."
– Nelson Mandela

The climate challenge demands that we find *transparently fair* ways of dividing the "burdens" and "efforts" of the global greenhouse transition, between nations and within them. To show how this could be done, EcoEquity and the Stockholm Environment Institute have developed the Greenhouse Development Rights (GDRs) framework,[4] which is designed to support rapid global decarbonization while, at the same time, safeguarding the right of all people everywhere to reach a reasonable, and sustainable, level of human development. More particularly, the GDRs framework was developed under the premise that if the rich do not provide the technology and finance needed to drive an emergency program of clean energy development in the South, there's little hope of avoiding a global climate catastrophe.

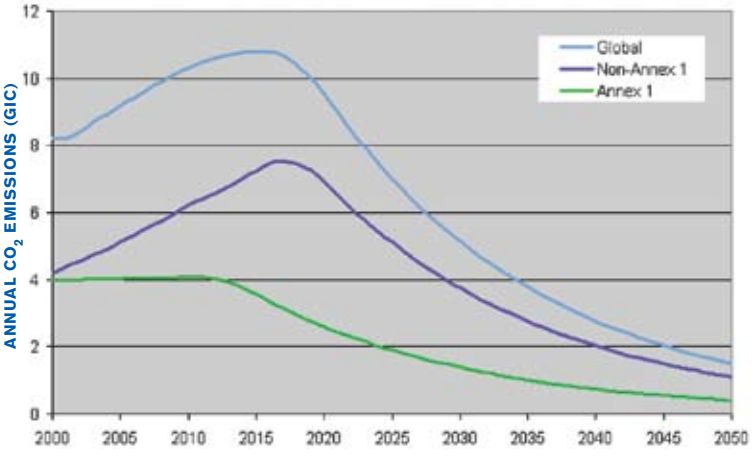


Figure 1: The light blue line shows overall emissions reductions needed to avert climate catastrophe. The green line shows the reductions path Northern countries must take, the dark blue line shows the emissions left to the South.

Greenhouse Development Rights builds upon the official principles of the UN's Framework Convention on Climate Change, according to which signatory states commit themselves to "protect the climate system … on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities." On the basis, that is, of their historic and current *responsibility* for creating the problem and their *capacity* to pay for the solutions. The GDRs framework combines the two into a single obligation indicator, which is used to determine both a nation's obligations to reduce emissions and, critically, its obligations to pay for climate change adaptation efforts such as flood risk management and drought-resilient water systems.[5]

Within the GDRs framework, each nation is obligated to bear its "fair share" of the global burden of climate stabilization, however large it turns out to be. If that burden turns out to be small (which is unlikely at this point), then even the US – a wealthy country with a large historical responsibility – will have a small obligation. But if it turns out to be large, then the transparency and fairness of the rules by which national obligations are determined will be absolutely critical. Under emergency conditions, obscure, ad hoc arrangements – products of closed-door horse-trading between government negotiators – simply will not do.

Such a principle-based approach solves a number of problems. For one thing, it means that a wealthy nation's obligations can exceed the mitigation of its own emissions, as they must if we're to support a sustainable emergency climate mobilization. Consider the US, which by dint of its outsized responsibility and capacity must inevitably bear a large fraction of any reasonably calculated global obligation. Why then, as things stand today, do we speak only of the emissions cuts that it must make at home? True, those cuts must be large, but isn't the real question how the US, through a mix of domestic and international efforts, can best fulfill its share of the necessary global effort?

Also, calculating national obligations as shares of a global effort opens the door to new ways to conceiving of those obligations, ways that actually make sense because they focus not on the confused distinction between the North and the South but rather on the more fundamental distinction between the rich and the poor. Is Saudi Arabia still a developing country? Is Singapore? If so, does this mean that their elites, some of whom are extremely wealthy, should be exempt from all mandatory action under an emergency global climate transition? If so, then what about the US? Should it not also be exempt because so many of its citizens are both impoverished and powerless? If not, why not?

The truth is that no simple North-South model can yield a fair global burden-sharing system. In fact, to be defensibly fair, such a system must apportion obligations not between nations but between wealthy and developing *individuals*. Which is not to deny that this is a world of

Maasai farmers protest climate injustice. Photo: Practical Action

nations, or that, ultimately, nations and not individuals must accept and discharge the obligations of any climate treaty. In the end, however, a nation's obligations should come down to the obligations of its citizens. Only by looking at the problem in this way can we finally make sense of it.

In practice, we have a choice. We can give up on the notion of a fair global climate transition, or we can take intra-national inequality into proper account. GDRs chooses the latter path and proceeds pragmatically – it calculates national obligations in terms of a global "development threshold" that divides the poor, their emissions, and their income from the emissions and economic activity of those above the threshold – not only the truly rich, but all members of the "global consuming class." GDRs builds upon older approaches to global climate justice, but rather than seeking to protect "survival emissions" from the pressures of the climate regime, it sets the bar higher, and seeks to protect all economic activity below a "dignified level of human development."

The GDRs framework sets the "development threshold" at $9,000 per person per year (in purchasing power parity terms). This is a global threshold, and it is emphatically not an "extreme poverty" line, which is typically defined to be so low ($1 or $2 a day) as to be more properly called a "destitution line." Rather, the GDRs development threshold is based on best-available notions of a "global poverty line," and defined to reflect a level of welfare that's beyond basic needs, but well short of today's levels of "affluent" consumption. People with incomes below the development threshold have little responsibility for the climate problem and relatively little capacity to invest in solving it.

Here's the punch line: under a system like GDRs, even poor developing countries have obligations, but these are the obligations appropriate to their small wealthy, or relatively wealthy, sub-populations. And these sub-populations can be small indeed. In India's case, for example, less than one percent of the population has an income greater than the development

threshold, and their combined income above the threshold – their capacity – is less than one percent of the aggregate national income. Compare this to the US, where a much larger portion (nearly 90%) of the population has incomes above the threshold, and share an income above the threshold. Or China, which falls between India and the US with about 10% of its population in the global consuming class.

All of which is much easier to explain if you look at the GDRs' burden-sharing system as a global income tax, for then you see that the development threshold simply marks a "0% tax bracket," set so as to exempt the resources of those who've not yet reached it. This is why the US, with its large percentage of the world's rich population, has a lion's share of global capacity. It has a similarly disproportionate share of the global responsibility, and thus of the overall global obligation. Indeed, the Greenhouse Development Rights system tells us that the US has about 36% of total global obligation, while China has about 3% and India has about one-tenth of one percent.[6]

These are striking numbers with extremely significant political implications. They mean, for example, that any parity implied by the innumerable press reports that Chinese emissions equal or will soon exceed US emissions is utter nonsense. For such "parity" takes no account of developmental equity, historical emissions or capacity to pay. Even more significantly, the GDRs obligation numbers imply that the impasse between North and South, an impasse that threatens to condemn us to an emissions pathway that leads only to catastrophe, can actually be resolved. This is because a global accord in which each nation pays its fair share is, finally, possible. Not that it would be easy to negotiate, or that it could be done without courage and leadership on all sides – in the North and the South, and among the NGOs as well. But legitimately defined, such an accord would neither endanger the development of the poor nor allow a free ride for the rich.

Finally, two closely related points. First, the obligations calculated by Greenhouse Development Rights, or by any principle-based burden-sharing system, must be translated, at the end of the day, into (in the language of the declaration agreed at the 2007 UN climate talks in Bali) "measurable, reportable, and verifiable" financial transfers from the rich world to the poor. In part these are obligations to pay for adaptation, but first they must support emissions reductions, because our overarching goal must be nothing less than the rapid and almost complete decarbonization of the *global* economy. There's a lot to be said about these international financial transfers, but two points are critical – they will be large, and managing them properly is going to be a massive institutional challenge. What kind of institutions will we need to face that challenge? The only brief answer is "all sorts of institutions," and all of them will have to be well designed and well regulated. This means that fund-based institutions will have to be effectively and democratically managed – easier said than done, as history has shown. And it means that market-based institutions will have to generate verifiable physical emissions reductions under a global cap, rather than continuing the tradition of fraud and cynicism so ably pioneered by the Clean Development Mechanism.

Second, it's no accident that Greenhouse Development Rights comes, in the end, to a progressive global tax. For while it's quite impossible to avoid the conclusion that, if we indeed wish to escape the climate trap, the wealthy must pay to make this possible, it's equally clear that such payment cannot simply be seen as a subsidy paid by rich nations to developing ones. Even within the implacable logic of the North-South climate impasse, class differences within nations matter. Indeed, they are inescapable. The US, for example, will never agree to pay its large fraction of the total global mitigation and adaption "bill" if the "wealthy" people in the Indian and Chinese nations are not also paying their "fair shares."

In the end, only a few things matter. First, we are entirely justified in speaking of a global climate emergency. Secondly, even when resorting to such "hot" language, we do nothing to cede our right to the language of hope. Which is why, among all the analogies now being invoked to speak of the necessary mobilization – an Apollo Project, a Marshall Plan, and so on – the best may well be the US World War II mobilization, and especially the "New Deal" that made it possible. It's particularly apt because that mobilization had a great deal to do with justice, with opportunity, with the solidarity of real as well as imaginary community. And if anything is clear about the climate mobilization, it's that solidarity will figure large this time around as well.

Tom Athanasiou is the author of *Divided Planet: The Ecology of Rich and Poor,* and co-author of *Dead Heat: Global Justice and Global Warming.* He is the director of EcoEquity, an activist think-tank focusing on climate justice.

NOTES

1 Sutton, P. (2008) "Climate Code Red: the case for a sustainability emergency," at www.climatecodered.net, and, more formally, Lenton T.M. et al. (2008), "Tipping elements in the Earth's climate system," *Proceedings of the National Academy of Science,* 12 February.

2 Hansen, J. et. al., (2008) "Target Atmospheric CO_2: Where Should Humanity Aim?" www.columbia.edu/~jeh1/2008/TargetCO_2_20080407.pdf

3 For details, see Baer, P. and Mastrandrea, M., "High Stakes: Designing emissions pathways to reduce the risk of dangerous climate change," London, 2006: Institute for Public Policy Research. www.ippr.org.

4 Baer, P., T. Athanasiou and S. Kartha, 2007. "The Right to Development in a Climate Constrained World: The Greenhouse Development Rights Framework." www.ecoequity.org/GDRs.

5 Although adaptation is often treated as secondary, it's anything but; a great deal of climate-related suffering is already "locked into" our future, and it cannot be ignored. There are excellent reasons to doubt the viability of any climate stabilization framework that seeks to ignore or even minimize the need for global adaptation.

6 Greenhouse Development Rights is an open source policy framework. All data and calculations, for all countries and regions, are in the public domain, and alternative formulations are welcome. See www.ecoequity.org/GDRs.

DAMS, RIVERS AND PEOPLE: AN UPDATE by Peter Bosshard

Salmon fisheries collapse. Authorities closed the salmon fishing season off California and Oregon, after an "unprecedented collapse" of California's largest salmon run. The number of king salmon returning from the Pacific to spawn in the Sacramento River last fall was down by more than 88% from its all-time high. Oceanic changes linked to global warming may be a factor, though the runs have suffered for decades from dams, levees, mining and over-pumping of water to feed farms and cities.

World Bank continues big money for big dams. In 2007, the World Bank again approved more funding for large hydro projects ($751 million) than for renewable energy and energy efficiency combined ($683 million). In April, the Bank's Board of Directors approved funding for the 250 MW Bujagali Dam on the White Nile in Uganda. Affected people filed a complaint against the project with the World Bank's Inspection Panel.

Repression against dam opponents. On June 13, 2007, security forces killed four and wounded more than eight Nubians during a protest against the Kajbar Dam in Northern Sudan. Anti-dam activists and journalists who covered the topic were also repeatedly detained by the Sudanese security forces.

Dams continue to kill. In November 2007, a dam holding back iron ore waste collapsed at a mine in Northern China, leaving six people dead and seven missing. In December 2007, more than 20 people were killed in the Dominican Republic after the authorities opened the gates of the Tavera Dam without warning during a severe storm. In January 2008, the Espora and Apertadinho dams in Brazil ruptured, causing massive environmental and property damage. In October 2007, the Army Corps of Engineers and the US special inspector general for Iraq reconstruction warned of the potential for catastrophic failure of the Mosul Dam in Iraq. Its collapse could drown as many as 500,000 people.

A bad year for the Amazon. In April 2007, Brazil's federal court gave the go-ahead for an environmental impact statement for Belo Monte Dam on the Xingu River, one of the biggest Amazon tributaries. In July, the country's environmental protection agency, under strong pressure from President Lula, licensed the San Antonio and Jirau dams on the Madeira River, also a major tributary of the Amazon. And in December, the government auctioned off the San Antonio hydropower project to a private Brazilian consortium.

HOTSPOT Patagonia threatened. A private consortium is pushing to dam two pristine rivers in Patagonia's Aysen region to generate electricity for Chile's cities and copper industry. The project's electricity would be sent thousands of kilometers to the north through transmission lines that would create one of the world's longest clear-cuts. Local and international NGOs are targeting companies involved in the project.

Wind blows past large hydro. The 21,000 MW of new wind power added globally in 2007 far new large hydro, which added an estimated 7,000 MW.

HOTSPOT Export credit agencies help destroy ancient town. In March 2007, the export credit agencies of Austria, Germany and Switzerland approved support for the Ilisu Dam on the Tigris in southeast Turkey. The dam will affect more than 70,000 people and flood Hasankeyf, a 10,000 year-old town. The Turkish dam builder has so far failed to comply with the conditions put forward by the export credit agencies, and European governments may suspend disbursements for the project.

Yangtze dams reconsidered. In September 2007, senior Chinese government officials warned that because of widespread erosion and landslides, the Three Gorges Dam on the Yangtze could become an "environmental catastrophe." Further upstream, local government officials in Yunnan indicated in December that they may abandon a controversial dam at the Tiger Leaping Gorge. The gorge is one of the world's deepest canyons and a mythical place in China's history and culture.

HOTSPOT Meanwhile, Chinese power companies continue to press ahead with plans to build several massive dams on the middle portion of the Jinsha River (Upper Yangtze).

Courts block construction at Omkareshwar. After years of grassroots mobilization, India's Supreme Court in September 2007 stopped construction of the Omkareshwar Dam on the Narmada River in order to prevent the submergence of more villages.

HOTSPOT Himalayas – big hydro's latest frontier. The peace process in Nepal and increasingly aggressive Indian and Chinese dam builders are threatening the Himalayas' fragile ecosystems. Indian dam builders are developing projects in the country's north and northeast, and in Nepal. Chinese developers are considering diverting the Tsangpo (Brahmaputra) on the Tibetan plateau.

Chinese damming on a global scale. Chinese dam builders and financiers continue to expand their global reach. In 2007, they signed agreements and contracts to develop large hydro projects including Bui (Ghana), Jatigede (Indonesia), Mambilla (Nigeria), Nam Ngum 5, Nam Ou 2, Paklay and Pak Beng (Laos), and Tasang (Burma).

HOTSPOT White elephant on the Congo? Southern Africa faces massive power shortages, not least due to governments' neglect of renewable energy and energy efficiency. Governments and the dam industry are pushing forward with plans to build the gargantuan, $80 billion Grand Inga scheme on the Congo River. The project would not address the energy needs of the rural poor, and would likely exacerbate corruption and conflict in the already troubled region.

HOTSPOT Controversial dams threaten the Mekong. China Southern Power Grid Corporation plans to build the hugely destructive Sambor Dam on the Mekong in Cambodia. Malaysia's Mega First Corporation signed a contract to build the Don Sahong Dam on the Mekong in Laos.

The struggle continues. Around the world, activists continue the fight to defend rivers and oppose dams. On March 14, 2007, over 100 groups from at least 30 countries participated in the International Day of Action for rivers and against dams. In December 2007, Bishop Luiz Flavio Cappio staged a 23-day hunger strike to protest the diversion of the São Francisco, Brazil's third longest river. In mid-2007, two activists went on hunger strike for an incredible 63 days to protest the Teesta IV Dam in the Indian Himalayan state of Sikkim. They renewed their hunger strike in March 2008.

PROFILES IN COURAGE

Cambodia's Rivers Protection Network

by Carl Middleton

When the Sesan River started behaving unusually in late 1996, communities in Northeast Cambodia attributed it to the spirits that they believe in. But something more worldly was at work: just upstream and across the border, construction had begun on the Yali Falls Dam, which would decimate the river they had depended on for generations.

For over a decade now, 55,000 villagers from more than ten ethnic minority groups in Cambodia's Ratanakiri and Stung Treng provinces and many thousands more villagers in Vietnam's central highlands have suffered the loss of rice production and riverbank gardens, drowned livestock, ruined fisheries, poor water quality, and washed-away belongings due to the dam. Massive water releases have resulted in flash flooding, causing the deaths of at least 39 people.

Yet, from this grim picture has emerged the Sesan-Srepok-Sekong Protection Network, a determined peoples' movement that strives to defend Northeast Cambodia's rivers and protect community rights. Despite the provinces' remoteness from Cambodia's capital, Phnom Penh, and reluctance by politicians and the dam's developers to accept the communities' claims or even meet with affected communities, the activities of the network and its allies have firmly placed the cross-border impacts of Vietnam's dams onto the Cambodian and Vietnamese governments' agendas.

"After the Sesan River began to change drastically and there were several unusual floods, the community sent out a request for help from NGOs and the provincial government," explains Meach Mean, Deputy Coordinator of the network. "This led local and international NGOs to initiate a study of the community's suffering, which discovered the Yali Falls Dam as the reason for the downstream changes."

A year later, however, it became disappointingly clear to all concerned that an official solution to the crisis was not forthcoming, and the "Sesan Protection Network" (SPN) was born. "SPN was established in response to the community's concerns, to help communities link together and advocate for themselves," Meach Mean says.

SPN set to work building a network of respected community leaders that could legitimately voice the Sesan communities' concerns and demands. The network grew rapidly. "SPN held regular meetings and trainings with affected communities that focused on teaching communities about their rights, about network building, how to document impacts, how to do advocacy, and how to share their concerns with others," says Meach Mean. By 2004, the network was well established in all 60 villages along the river in Ratanakiri province. A partner community network grew downstream in Stung Treng province.

3SPN works to raise capacity with communities.

The SPN secretariat also forged a worldwide coalition of supporters that includes NGOs, lawyers, scientists, photographers, and writers. Their research has reinforced the communities' claims about the downstream impacts from the dam, and proposed frameworks for negotiation and resolution.

As SPN strengthened, it moved rapidly to draw attention to the situation on the Sesan River. At the First National Se San Workshop, in 2002, SPN community representatives publicly announced their demands. These included that the river's natural flow be restored, the dam's impacts studied, compensation provided, and further dam construction halted. This unified statement represented a remarkable achievement under difficult circumstances and marked the communities' first public call for justice.

Yet, Yali Falls was only the first of six dams that Vietnam had slated for the Sesan River, all of which have now been built or are under construction. Furthermore, in 2003, Vietnam commenced construction on a series of four dams on the neighboring Srepok River. Laos also plans extensive hydropower development along the Sekong River and its tributaries (for electricity export to Vietnam) that flows into Northeast Cambodia.

In response to this threat of even more-rampant hydropower development, SPN's movement grew. The original community activists have expanded the network to the Srepok River and built avenues of communication with communities along the Sekong River. The Sesan-Srepok-Sekong Protection Network (3SPN) now represents 74 villages along the Sesan and Srepok rivers.

Engaging the Vietnamese dam builders has, unsurprisingly, been a challenge, not least because in order to do so 3SPN has had to spur into action a reluctant Cambodian government to engage with an equally reluctant Vietnamese government. Even when bilateral government negotiations have taken place, it has proven difficult for the network to secure a seat at the table. Yet, these formidable challenges make the achievements of 3SPN all the more impressive. Both governments have implicitly acknowledged the Yali Falls Dam's destructive impacts. In 2002, Vietnam apologized for the destructive water releases of early 2000, and, in 2003, the Cambodian government requested that the Vietnamese government address the downstream impacts.

3SPN has also challenged Western donors involved in the projects to take responsibility for the downstream impacts. These include the Swedish and Swiss aid agencies that supported Yali Fall's woefully inadequate environmental impact assessment; the World Bank, which provided a loan for Yali Fall's transmission line, and Norway's aid agency, which supported hydropower master plans for the Sesan and Srepok Rivers.

Concerns voiced by 3SPN and others have prevented both the Japanese Bank for International Cooperation and the Asian Development Bank from backing dams on the Sesan and Srepok Rivers, and also compelled the Vietnamese dam developer, Electricity of Vietnam, to conduct transboundary environmental impact assessments for dam development on both rivers. January 2007 marked an important victory, when the dam developers presented the Srepok River's transboundary assessment in a public consultation to the Srepok communities for comment. "This workshop was the first time affected communities could meet directly with dam builders, donors and government representatives," says Meach Mean of 3SPN. "It was also the first time we were able to participate in the EIA process. The community learned a lot about EIAs and were able to comment about the impacts already being experienced and the report's recommended mitigation measures. At the workshop, Vietnam and Cambodia agreed to set up a bilateral task force to help mitigate the impacts. We hope that this will lead to finding solutions to the problems that communities are facing."

Along the Sesan, Srepok, and Sekong Rivers, communities are demanding to be heard. While compensation and redress have not yet been forthcoming, 3SPN has succeeded in challenging unrestrained destructive upstream hydropower development by demanding access to information, the accountability of the dam builders and their supporters, and a decision-making process that includes the genuine participation of affected communities.

For more information visit http://3spn.cfsites.org/ or email sesan@online.com.kh

Continued from page 15

and create sustainable employment opportunities. In the US, the Apollo Alliance (a coalition of environmental groups, labor unions and politicians) and the recently launched BlueGreen Alliance (a partnership of the Sierra Club with the United Steelworkers) are pushing to transform the economy into one based on renewable energy and "green jobs." The South African group Earthlife (Johannesburg) has commissioned a study that revealed if South Africa generated just 15% of total electricity in 2020 using renewables, it would create 36,400 new direct jobs, without taking any jobs away from coal-based electricity. And Germany's rapidly expanding green energy sector has seen a doubling of renewables jobs since 2004, with some 249,000 jobs in the sector today. The ministry estimates Germany will have up to 400,000 renewables jobs by 2020.

Youth on the March: Rising up from campuses and communities around the world, a youth movement is building to stop climate change. Young activists in the US, Europe, Australia, China and elsewhere are putting pressure on the decidedly youth-free political elite to get quicker, smarter actions to reduce emissions; sharing information between campuses and across generations; and taking personal responsibility for reducing their universities' and their own carbon footprints. From kicking off anti-coal campaigns, to bestowing "Fossil Fool Awards" on April Fools Day to the world's biggest climate polluters, to attending official climate negotiations, youth movements are picking up steam and becoming difficult for the powers that be to ignore. energyactioncoalition.org, itsgettinghotinhere.org, focusthenation.org

Photo: Energy Action Coalition

Fast Facts on Climate Change

BE VERY AFRAID: CLIMATE CHANGE BY THE NUMBERS

Current level of CO_2 in atmosphere: 385 parts per million

Current rate of increase annually: 2 ppm

Stabilization level needed to avoid "catastrophic effects," according to climate scientist James Hansen: 350 ppm

Stabilization level if all industrialized countries followed President Bush's recently announced "climate goal": 615 ppm

UN estimate of industrialized countries' greenhouse gas emission cuts needed by 2020 to avoid "dangerous" climate change: 25-40%

UN estimate of industrialized countries' emission cuts needed by 2050: 80-95%

International Energy Agency estimate of US emissions increase from 1990 to 2025: 38%

Temperature increase from pre-industrial levels at which "catastrophic effects" occur, according to James Hansen: 1.7°C

Projected long term temperature increase from pre-industrial levels resulting from President Bush's climate goal: 4.5-6°C

Temperature increase from pre-industrial levels at which UN warns 40-70% of all species will be at increased risk of extinction: 4.2°C

DAMMING THE CDM

Hydro projects in the CDM pipeline as of 1 April 2008:

Number of projects: 828

Number of large hydros (defined in CDM as 15 MW or above): 384

Annual revenues to hydro developers if all credits issued (@$20/credit): $1.55 billion

Number of projects approved by the CDM: 169

Number of large hydros approved by the CDM: 51

Largest hydro in the CDM pipeline: 1,020 MW (Tala Dam, Bhutan)

CDM hydro projects in China as of 1 April 2008:

Number of projects: 542

Number of large hydros: 280

Percentage of all CDM hydros: 65%

Annual revenues to Chinese developers if all credits issued (@$20/credit): $1.1 billion

Largest hydro in the CDM pipeline: 500 MW (Zhexi Dam expansion)

Sources include: James Hansen et al. (2008) "Target Atmospheric CO_2–Where Should Humanity Aim?"; "Spreadsheet of Hydro Projects in the CDM Project Pipeline," prepared by Ben Docker, at internationalrivers.org/en/node/1785.

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