The Inconvenient Truth, Part II

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Jan 18, 2007

An EcoEquity discussion paper

www.ecoequity.org/docs/InconvenientTruth2.pdf

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We've seen the movie, so we know the first part – we're in trouble deep. And one of the good things about 2006 is that this ceased to be a public secret. It's now out in the open. We not only know that the drought is spreading, the ice melting, the waters beginning to rise, but we also know that we know. And this changes everything.

The science is in, and the "skeptics" aren't what they used to be. They're still around, of course, but their ranks have thinned, and their funders are feeling the heat. It's fair to say, I think, that they've been reduced to a merely tactical danger. They're flaks and everyone knows it. Still, this good news comes with bad – their job was to stall, and they did it well. And it's now late in the game.

You don't have to take my word for it. 2006 was a year in which the scientists, men and women schooled in the arts of careful and measured conclusion, chose instead to speak frankly. So know that Dr. James Hansen, director of NASA's Goddard Institute of Space Studies and perhaps our single most respected climate scientist, spoke for many of his fellows when he said that we're "near a tipping point, a point of no return, beyond which the built in momentum and feedbacks will carry us to levels of climate change with staggering consequences for humanity and all of the residents of this planet."[1]

We're in trouble, and we know it. And it's time, past time really, for at least some of us to go beyond warning to planning, to start talking seriously about a global crash program to stabilize the climate.

Gore knows this, but he's a politician and must move deliberately. He is moving though; indeed he's already passed beyond his film's gentle implication (most visible in the upbeat visual call to action that ran under the closing credits) that personal virtue will suffice. In fact, during a September 2006 speech at the New York University Law School (a speech one wag called "the lost reel") he made some necessary, and dangerous, connections:

> "In rising to meet this challenge, we too will find self-renewal and transcendence and a new capacity for vision to see other crises in our time that cry out for solutions: 20 million HIV/AIDS orphans in Africa alone, civil wars fought by children, genocides and famines, the rape and pillage of our oceans and forests, an extinction crisis that threatens the web of life, and tens of millions of our fellow humans dying every year from easily preventable diseases. And, by rising to meet the climate crisis, we will find the vision and moral authority to see them not as political problems but as moral imperatives."

The situation, alas, is actually worse than either Gore's movie or his speech implies. So, this being a new year, let's move on a bit, to territories no politician can guide us into.

And let's be a bit more explicit about just what a crash program to stabilize the climate, a real one, would actually imply.

The easiest way to see the challenge is to consider "The Two Degree Line." I probably shouldn't refer to it this way, because this is two degrees *Centigrade* that we're talking about, and here in the U.S. the metric system is still resisted as an unacceptable multilateralist intrusion on our national sovereignty. But still, this *is* its name, and "The 3.6 Degree Line" just doesn't have the same ring. Also, it was the Europeans, along with scientists and climate activists from around the world, who established the notion that a line must be drawn, and not in terms of annual carbon emissions or even aggregate atmospheric carbon concentrations, but in terms of temperature change itself. And that 2°C was the best place to draw the line, to stand and say "this far, no further."

What happens, then, once the temperature – or more precisely the average global surface warming, since pre-industrial times – rises past 2°C? Nothing good, and a rising risk of catastrophic climate change.

Not that the 2°C line is given, stable, beyond dispute. We can't, in particular, say that a lesser warming would be safe. But the critical issue here, please note, is not scientific uncertainly. More to the point is that climate dangers depend greatly on both wealth and whereabouts. They can't be averaged across national populations, for these populations are themselves divided, most fundamentally by money. The rich, by and large, will be able to insulate themselves from the suffering and the sorrow, at least most of them, at least for a while. The poor, though largely innocent of responsibility for the warming, will bear the brunt of its "impacts."

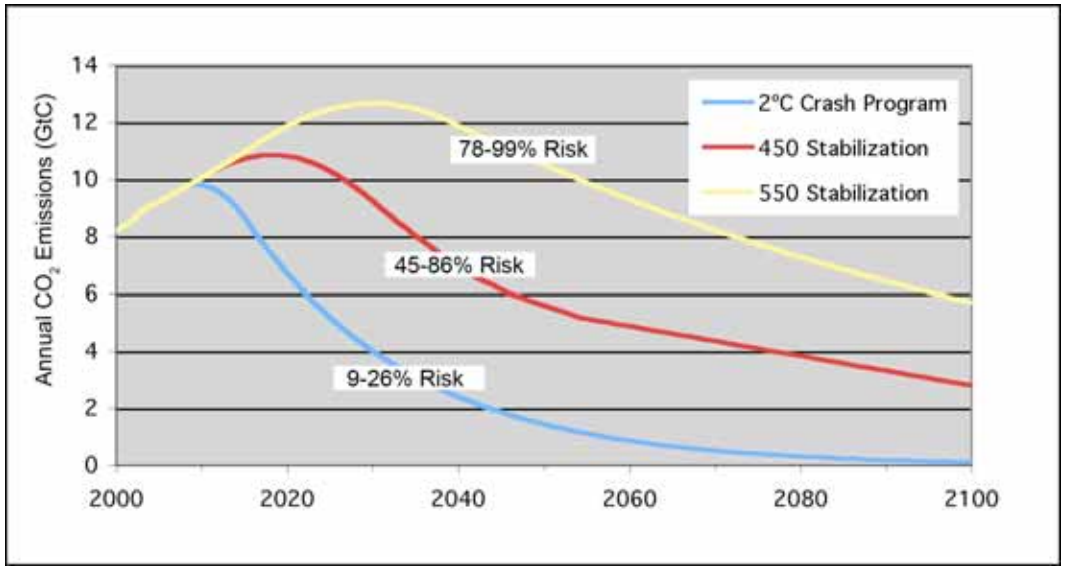
What, exactly, are the dangers? Well, for one thing, and even though we're not yet at the edge of the 2°C line, the Earth's ice sheets are already becoming unstable. The Greenland ice sheet, in particular, appears to be at significant risk of collapse at a warming of less than 2°C, and this would eventually mean about seven meters of sea level rise.[2] When you consider that only three meters would put virtually all coastal cities and their hundreds of millions of people at great hazard, and that the West Antarctic Ice Sheet is also at eventual risk, you can only conclude that ice situation is already, by any reasonable standard, "dangerous."[3]

And of course there's more. With 2°C of warming, we'll also see killer droughts settling in to stay; massive vegetation changes and agricultural disruptions; extreme weather and even superstorms; radically expanded ranges for many disease-bearing pests, putting, for example, several hundred million more people at risk of malaria; Arctic species such the polar bear facing extinction, along with 15-40 per cent of other terrestrial creatures; horrifying refugee crises; a weakening Gulf Stream. The key points, at least from the point of view of human suffering and social instability, are the ice-melt, the widespread agricultural disruption and the refugees. Also crucial are the billions of people, many of them in the mega-cities of the South, who will be threatened by permanent water stress. The danger should be obvious – more, and more terrible, water wars, many of which are in practice civil wars.[4]

Most terrifying of all, it now seems likely that 2°C of warming, particularly if sustained or overshot, would trigger non-linear changes that would induce further warming, and further changes, and further warming – "positive feedbacks" in the jargon – until the nightmare scenario imagined by James Lovelock (whom I am very sorry to report is not a crank) finally comes to pass. And this would make us all, even the rich among us, very regretful indeed. Lovelock anticipates a warming of 5°C, and argues that humanity's coming challenge will be to organize a "sustainable retreat" from current lifestyles, a retreat that may well include a survivor's migration to the poles. Still, according to Lovelock, there's no need to panic. "We are not all doomed. An awful lot of people will die, but I don't see the species dying out." [5]

What, then, would it take to hold the 2°C line? Given the slow progress to date, the only honest answer is "a heroic effort." To see just how heroic it would have to be, consider the three progressively more ambitious emissions trajectories shown in the figure below. Attend, in particular, to the probability ranges, which, following the current treatment of the key scientific uncertainties[6], estimate the risk that each trajectory would lead to a warming greater than 2ºC degrees.

The 2ºC Crash Program, its Alternatives and its Odds



Emissions pathways for three scenarios – a "2ºC Crash Program" and typical pathways for 450 ppm or 550 ppm CO_2 stabilization – along with the risk of exceeding the 2ºC threshold (as calculated by Baer and Mastrandrea 2006).

The most stringent of these trajectories, which I'll call the "2°C Crash Program," is heroic indeed. It has emissions peaking in 2010 and then dropping by a resolute 5% per year, leading to peak carbon-dioxide concentrations around 410 parts per million. Note then, that even with this almost inconceivable effort, we'd still be exposed to an alarming 9-26% risk of exceeding 2ºC degrees.[7]

Note, too, what this analysis tells us about today's conception of political realism. For the 450 ppm CO_2 trajectory (which was, until very recently, cited by most large U.S. climate organizations as being both safe and achievable) is likely to far overshoot 2ºC.

And the 550 ppm trajectory (which is still occasionally defended by people who claim to be fighting for a viable climate protection regime) can simply not be taken seriously, at least not as defensible mitigation target. It poses a 78-99% risk of exceeding 2ºC and a 28-71% risk of exceeding 3ºC, making it difficult to argue that arguments in favor of 550 ppm are anything more than irresponsible invitations to catastrophe.

This is a significant point, because practical men and women are still advocating targets in this neighborhood. Even the UK's much praised Stern Review of the economics of climate change does so, though in a manner so circumspect that you have to suspect that its authors are ashamed of their own fatalism.[8] Note, in any case, an argument being made by Joe Romm, the author of the http://climateprogress.org/ blog and the fine new book *Hell and High Water*. Romm claims that, in reality, "there is no '550 ppm' stabilization path because 550 would destroy the tundra, and take us to 700+ by 2100 and trigger yet more amplifying feedbacks that would spiral the system out of control. So we stabilize at or below 450, or ruin the planet for hundreds if not thousands of years." [9]

New horizons

So what's next? Lots of things, but one of them must surely be a new commitment to honesty. Like so: It will take a heroic effort and almost unimaginable international cooperation to hold the 2°C line, but it is still *physically* possible to do so. This is because already existing technologies, if developed and disseminated with true "global Manhattan Project" urgency, would support huge, rapid efficiency increases and emissions reductions[10], and buy us time to decarbonize our infrastructures, adopt fairer, lower-consumption lifestyles and, of course, develop better technologies. Technology, for its part, can allow us to save ourselves, but it's definitely not going to save us. How could it when the real problem is political? When we need William James' "Moral Equivalent of War" but suffer instead a slow incrementalism* that lags far behind the quickening increase in the atmospheric carbon concentration? When "realists" insist that only more incrementalism lies in our future, and imply, against all evidence, that it will take us, in time, through a "tipping point" and into a crash program that might actually work.

A word about the image of "the tipping point," for just now it marks the dominant school of American climate strategy. And why not? Clearly we'll need a new sense of urgency, and a new will to act, before we can engage the climate crisis in anything like a serious way. And how could we possibly approach such a change except by degrees? None that I can think of, for the core of the climate problem is after all that the needed transformation is just not yet possible. Thus, the tipping point strategy: to press forward

* Examples include a project-based "clean development mechanism" riddled with fatal baseline problems, self-defeating emissions-trading systems designed to placate corporations and keep the price of carbon low, and, in truth, the Kyoto Protocol itself. The future threatens numerous weak domestic bills like Jeff Bingaman's and, globally, the likelihood that the post-Kyoto system will fail to even prefigure the regime needed in the developing world.

on every front, to seek small steps that open into larger ones, to eventually take the big step that makes the big difference, to reach the point where the impossible becomes possible, and even inevitable.

It's a good strategy. But the extremely widespread sense that it's the only way forward is a different matter indeed. It's as if, outside from a few minor policy disputes, there's really nothing to do except demand action of leaders who are basically on the right track. As if there's no need to seriously examine the actual structure of the climate problem, or to think critically about the problems that any viable framework will have to solve. As if nothing was missing.

But something is. And Al Gore's striking concept of "an inconvenient truth" is the ideal name by which to seek it. And this is true even though the real "inconvenient truth" goes far beyond the message of Gore's film. Sure, it begins with Gore's warning that time is short, but it's also about how today's sticking point − the global climate policy impasse – has everything to do with economic inequality. And how that economic inequality is increasing around the world. And how our prosperity depends upon the suffering of others (e.g. dirt-cheap Chinese labor). And how the market, inevitable though it may be, repeatedly fails in crushing, irreversible ways.

All this, moreover, is now on the agenda – the climate agenda. And if we're to know what to do with it, we had best be clear about how it got there. We had best, in particular, remember Katrina, and know that this motion we now feel beneath our feet, these shudders on the once frozen plains of climate politics, were paid for, and dearly.

Katrina is very much part of this story, for it ended the time in which climate could be plausibly framed as a merely environmental issue, even as it crystallized the moment when the American people finally tired of the lies. By so doing it insured that the scientific community's increasingly bold words would fall on receptive ears. That the oil economy, the Mideast war, the rising inequality, and the changing climate would all run together into a single blurred image of approaching reckoning. That climate change, which the pundits so long insisted was only a niche concern, would turn out to be much, much more. And not just because it reveals such a terrific danger, but because the danger it reveals fits so closely and so well with all the other dangers now visible around us, because it casts their logic too into stark relief.

The urgency, then, is only a first inconvenient truth. Gore put it on the screen and we've faced it, at least enough to put climate protection finally onto the agenda. Now comes the hard part – winning adequate action, globally and in time. For just as the needed breakthrough is a global one that can only come with U.S. support and even leadership, so too decisive domestic action, a precondition for such leadership, is only possible against a background of global progress. A bit of a knot, this, but there's no way around it. Because everything depends on breaking the global impasse before it sets into a deadlock. And because, whatever is or is not happening in the U.S., the global climate impasse is deepening.

Which brings us, finally, to "part II" of the inconvenient truth. To the standoff between the rich and developing worlds, and to the cold reality that it will not yield to an assault

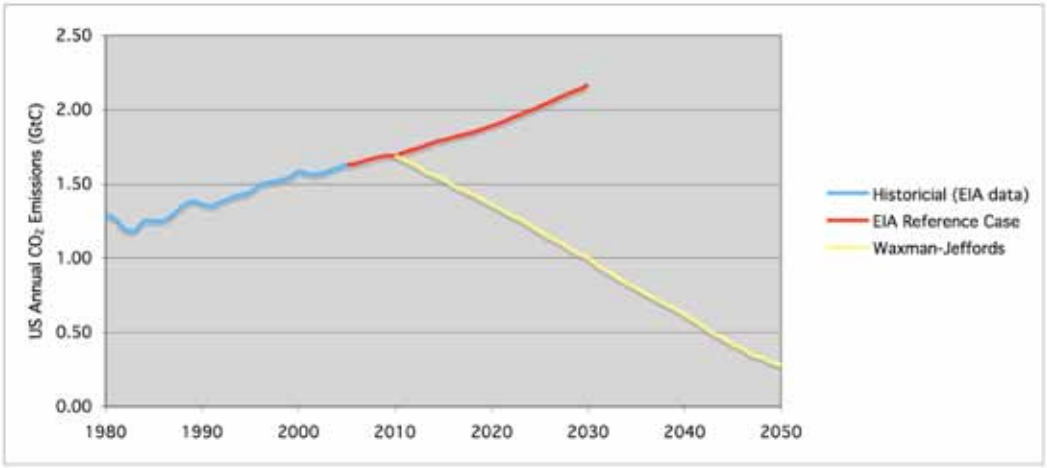
composed entirely of incremental, "realistic," politically acceptable initiatives. Why not? Because its logic is too strong, and too over-determined. How could it be otherwise when its deepest core is that we, the citizens of the rich world, have already consumed the bulk of the global carbon budget? That there's precious little left for the citizens of the South? And that, given this rather implacable reality, the only way to move forward quickly enough is for the rich, who became rich in an open world that no longer exists, to pay the entire costs of the necessary global crash program.

Inconvenient, yes. But it's fairly easy to show why this is the case.

Consider the climate bills that we in the U.S. must now rally around. I'm thinking of Henry's Waxman's Safe Climate Act, Senator Jefford's Global Warming Pollution Reduction Act (reintroduced by Senator Sanders) and, of course, the California Global Warming Solutions Act of 2006. All are remarkable, for this reason above all others: they define domestic emissions reductions trajectories that are close to the needed scale!

The exact specification of this "Waxman-Jeffords trajectory" varies in the three cases, but just a little. In all cases the U.S. would be required to freeze its greenhouse gas emissions in 2010. Emissions would then be cut by roughly 2% per year, returning to 1990 emissions levels by 2020. After 2020, the rate of decrease would rise to the point where it averaged about 5% per year, so that, by 2050, U.S. emissions would be 80% lower than then were in 1990. Like so:

The "Waxman-Jeffords Trajectory"



The "Waxman-Jeffords" emissions reductions trajectory, plotted against historical U.S. emissions and the U.S. Energy Information Administration reference case projection of those emissions.

Looking backward, it's pretty amazing that this sort of decline is actually on the U.S. political agenda. Yet it is. Indeed, the "Emissions Freeze" movement that Gore is now talking about would, essentially, be a movement designed to prepare the ground for this sort of reduction. And even if, in the short term, the Waxman-Jeffords trajectory doesn't have a snowball's chance of actually becoming law, its rising prominence is clearly a sign of the times.

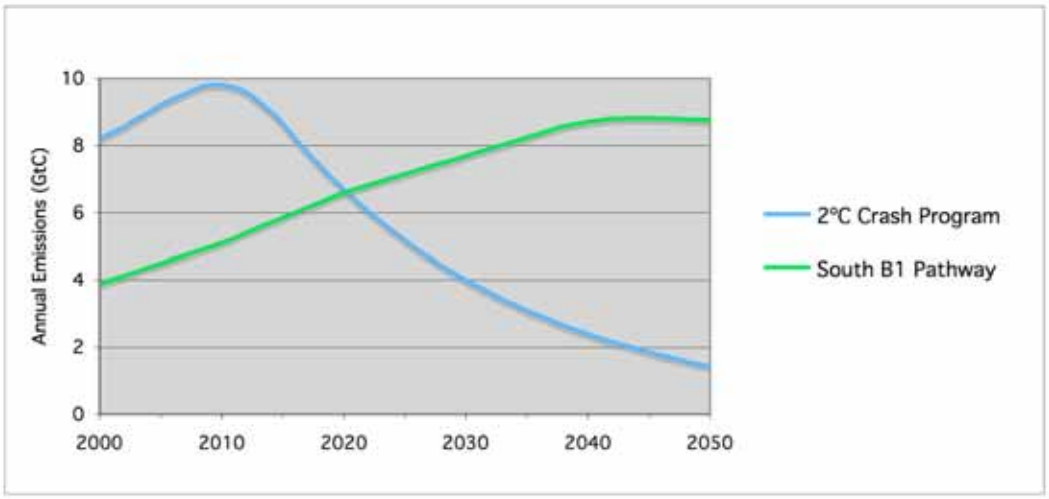
Such signs, alas, are of rather limited interest. What we really need is to make this trajectory real. We need to restructure our economy around it, hold to it despite powerful and inevitable backlash, establish it at the core of a new American dream. All of which would require unprecedented domestic change, and all of which (my point) will prove to be quite impossible if domestic change is alone on the agenda.

The U.S., after all, no longer stands apart from the winds of globalization. Given this, and given the roiling and dislocation that Waxman-Jeffords would inevitably bring, it's hard to see how it could be successfully justified – politically, technologically, culturally or economically – save against the background of a global crash program. In fact, it's hard to see how Waxman-Jeffords would even be possible absent an equally ambitious global climate program, for it would, above all, demand that there be a substantial price on carbon emissions. And imposing such a price, even within its own borders, is beyond the power of the U.S. alone.

There's an irony here, for the 2ºC crash program, the global key to sustained domestic action, would by any reasonable reckoning cost the U.S. – with its wealth and outsized responsibility – far more than would domestic action alone. But with this all-important difference: the expense would be entirely legitimate. It would be the expense of a great nation accepting its proper burden. And it would not be futile. Indeed it just might be all-important. For before any kind of global crash program is possible, the U.S. will have to return to the global negotiations as a leader that can legitimately speak for a just and viable climate regime. And after the Bush years, such legitimacy will not come easily. Indeed, it will require the US to take meaningful steps towards meeting its international obligations. And this, for better or for worse, will demand more than just reducing U.S. emissions to 80 percent below their 1990 level by 2050.

Want another inconvenient truth? Take a look at this:

The South's Lost Opportunity



Available Southern emissions budget under the 2ºC Crash Program, plotted against the South's SRES B1 pathway emissions. Note that Northern emissions are assumed to magically drop to zero in 2020 – the South's budget reflects the *entire* global emissions budget.

This figure, which my collaborators and I[11] tend to call “The South Hits the Wall,” shows the global carbon emissions trajectory associated with a 2°C crash program, plotted against the developing world’s total emissions, as projected in the Intergovernmental Panel on Climate Change’s “B1” scenario. The B1 scenario describes an upbeat and relatively equitable future in which emissions growth is actually quite modest when compared to any likely variant of “business as usual,” yet even so, the South’s emissions alone take us hurtling far into the danger zone in only about 15 years!

What’s striking about this comparison is that it demonstrates that any truly precautionary global emissions trajectory is radically inconsistent with even this optimistic reference projection of Southern emissions. Which means that we’ll have to do better, much better, and soon. Which in turn means that, if we’re to avoid a terrifying future in which temperature change overshoots 2°C, then Southern emissions are going to have to be somehow curbed, even while the South and its people are still struggling out of poverty, while food security, safe-water, and basic health care are still routinely out the reach of billions of people.

Nor does any of this come as any particular surprise in the developing world, which is why Southern negotiators have repeatedly insisted that they’ll refuse any climate treaty that even threatens to “lock in” global poverty and inequality. Nor is there any reason to think that this is an idle bluff, a mere bargaining position. Take it, rather, as a warning, and a prod to consider the challenge here – what kind of climate regime can possibly suffice? What kind of climate regime can square the circle of development, enabling rapid global emissions declines even while enabling the South to continue, and step up, its fight against poverty?

It’s possible; it has to be. But we’d best be clear about the structure of the problem. So here goes: There really are “limits to growth.” They’re not as simple as folks thought way back when the term first came into currency, but they’re real none-the-less. The “atmospheric space”[12] really is about gone. We in the “industrialized world” really did use most of it up in the last couple of centuries. Oh, sure, we can pump a few hundred more Gigatonnes of carbon into the air and still hold the line at 2°C, but that’s about it, and if we overshoot the line, we’re going to have a devil of a time returning to it. Meanwhile, the suffering and the damage caused by the changing climate is going to get much worse as we approach 2°C. Which we’re almost certainly going to do, if only because there are billions of people in the “developing world” who are determined to improve their lives by any means necessary, and because, just now, this tends to mean carbon-based energy production.

Not that I can read the future, but I can read graphs. It’s pretty clear that, if we’re going to avoid a climate catastrophe, it’s going to be by way of an “overshoot and decline trajectory” whereby we enter the hot zone as late as humanly possible, and leave it as early. We’ll have to, before the temperature rises enough to set off critical positive feedbacks (like, say, a massive pulse of methane from the melting Arctic permafrost) that would, for all human purposes, be irreversible. This means that global emissions have to peak soon – yesterday wouldn’t be too soon – and then go into a long, rapid and sustained decline. Our common future, in other words, lies in “low-emissions” trajectories that economists in particular (though we can’t blame everything on

economists) find not only inconvenient but positively absurd. Which, not at all incidentally, is why such scenarios, which are not “least cost” by standard economic reckoning, have not been widely studied.

But if we want a low-emissions trajectory in our future, we’re going to have to break the global impasse to get it. And this is only going to happen within a climate regime that takes due account of the real logic of our bitterly divided civilization, which does not encourage enlightened global cooperation. It’s a challenge, and it has implications. For one thing, we’re going to have to see to it – seriously this time – that the climate regime improves the lives of the poor by widening its focus from “decarbonization” and ensuring that, even under an extremely constraining low-emissions trajectory, the South is able to make real progress in its drive for development. And we’re going to have to face the challenge of “adaptation” by honestly straining to protect the vulnerable, in the floodplains of New Orleans and the deserts of Sudan, from the now-inevitable inundations and droughts. And, one way or another, we’re going to have to answer the critical “Who Pays?” question that lies, and has always lain, at the heart of global climate politics.[13]

It’s a huge agenda, but there is a bottom line: however you slice it, the climate regime – the formal international regime embodied in the UN’s Framework Convention on Climate Change, in the Kyoto Protocol, in the “Kyoto Plus” agreement that our representatives are supposed, even at this moment, to be actively negotiating – must spare the South from any compulsion to make an impossible choice between climate protection on the one hand and “development” on the other.

The real need here is what Americans, in particular, might call a Global New Deal. Like the original, it would focus on stabilizing and improving the lives of the vulnerable, restless poor. But this time the institution building and the politics would be global, and this time the background crisis – the threat that demands cooperation and, by so doing, animates the whole effort – would be as much social-ecological as it is socio-economic. But having said this, I should be clear. My point isn’t to call for a climate regime *as* a global new deal, but to argue, along with many others, that such a new deal is desperately needed, and to add that any viable global climate regime must be at least consistent with it, a step in the same general direction. And if this implies that any viable global climate regime must make significant demands on the rich countries – and it does – this should not be taken as an invitation to despair, as if it pushed meaningful climate protection even further out of reach. Just the contrary, because rich-world tolerance for the suffering of the poor is a big part of the problem, one that could become fatally poisonous in the years just ahead. If we’re going to get our arms around the climate crisis, we’re going to have to know ourselves to be “in this together.” If we don’t, we’re not going to make it. This, moreover, is not merely my personal preference, leaking into my wishful thinking and therefore my analysis. It reflects the structure of the problem. The elites, in the U.S. as in Brussels and Brasilia and Beijing, can see it just as clearly as do I, and when they are moved to look, they do.

Should I be more blunt? Perhaps, for during the last five or so years, the U.S. climate movement has generally held itself aloof from international matters. And this doesn’t just mean that it’s avoided linking the climate battle too closely to the related battles over

globalization, trade, and international economic institutions, but also that it's turned away from the international climate battle itself – the one that's centered in the climate negotiations and the nascent mechanisms of the Kyoto Protocol – in favor of a strategy of local, state, and regional action. Not, I hasten to add, that this has been a bad move. Just the contrary. The Bush regime, after all, has spent this same time doing all it could to deadlock or destroy the global negotiations, so what, really, beyond rear-guard opposition, could the US climate movement have hoped to contribute?

Not much, perhaps, though a better record of international solidarity, one in which development rights and adaptation assistance were more than minor footnotes, would be nice. But, still, the U.S. climate movement's turn to the domestic has been a big success. Local and state and regional climate regimes are proliferating, and it's just because they are that real climate regulation is finally on the national agenda.

So far so good. But success has its dangers. Which is why it's reasonable to fear that we'll ride this horse too long. That, even as global deadlock emerges as the critical issue, American climate strategists will maintain their almost exclusive focus on domestic campaigns designed to win national legislation. And this despite the likelihood that such a strategy will fail.

Cut back to the coming battle for meaningful U.S. climate legislation, as in the Waxman-Jeffords trajectory. For here, alas, the tea leaves are all to easy to read. The echoes of 1997's battle of Kyoto – which the US climate movement emphatically lost to a well-funded industry campaign designed to argue that the Kyoto Protocol was "unfair" and "would not work" – are already sounding. And next time, like last time, we'll be facing lots of heat from politicians, including old-school Democrats (check out this interview with John Dingell, veteran representative and soon to be head of the House Energy and Commerce Committee), looking to strike statesmanlike poses from which to argue that the demands of the science are not to be taken too seriously. Not, at least, by mature, worldly men and women capable of rejecting unrealistic strategies that threaten, in Dingell's pungent words, to "destitute American industry."

Facing such a mire, we might even be tempted to argue that if "we" take responsibility for "our" emissions, then the Chinese, along with the rest of the developing world, should also take responsibility for "theirs." Perhaps even that we should pressure them to do so. It would be an easy way to go, for Chinese emissions are now projected to exceed U.S. emissions by 2009, a full decade earlier than previously expected[14], and particularly because China is being so widely auditioned as a rising economic and even political threat, a new adversary for a new century.

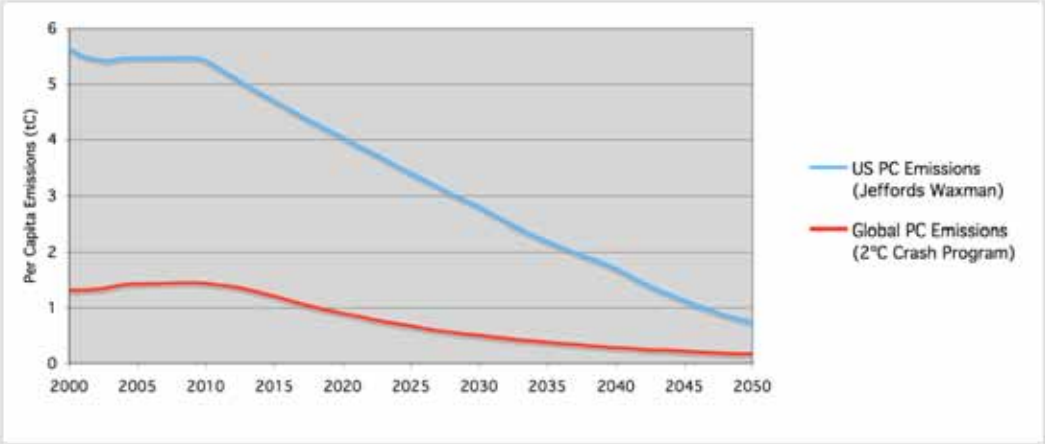
It would be an easy way to go, and it would be a big mistake, one that would undermine U.S. credibility abroad and – an unwelcome bonus – thicken the fogs here at home. For though U.S. climate groups have done far too little to help the American people understand this simple fact, aggregate national emissions statistics – the ones in which China will soon surpass the U.S. – are generally quite misleading. When it comes to the politics of climate and, in particular, the politics of "international burden sharing," clarity begins instead with a more basic truth, the one that first becomes visible with per-capita

numbers and then, when we're ready to get serious, requires that we think in terms of wealth and poverty themselves.

Development, capacity and need

Consider the following graph, which plots the Waxman-Jeffords trajectory against the emissions trajectory associated with a 2°C crash program, and shows both in per-capita terms:

Waxman-Jeffords vs. the 2C Crash Program, in Per-Capita Terms



Per-capita emissions projections for both the Waxman-Jeffords trajectory and the 2°C crash program

The point here is that even after four decades on the Waxman-Jeffords diet, the American people would still be emitting more than their share of the global emissions budget associated with a 2°C crash program – more than four times more, by the not-unreasonable calculation behind this graph.[15] Which is not to say that Waxman-Jeffords isn't a strict U.S. emissions reduction trajectory, but only that domestic reductions can't possibly be the whole story, not in terms of U.S. obligations within a global climate regime that's fair enough to be viable.

And the relevance of per-capita metrics is only part of the story. There's also historical responsibility, another measure by which U.S. emissions are far, far higher than Chinese. And then there are more subtle considerations, peculiar to the globalized economy of manufacture. Like the fact that, every time a corporation imports an ingot or a TV or a toy from China, they import as well the carbon that is "embodied" in it, carbon that no one today, Chinese or American, takes one whit of responsibility for.

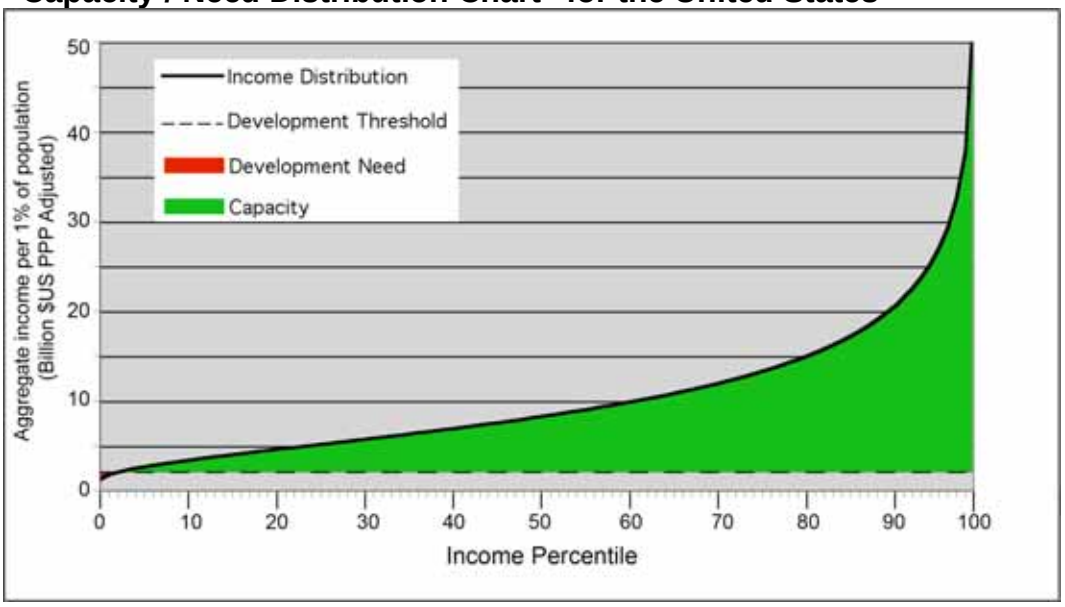
Terry Tamminen, who was until recently California Governor Arnold Schwarzenegger's top environmental adviser, was exaggerating when he told a *Grist Magazine* interviewer that: "Why is it that China is building 1,000 megawatts of coal-fired power plants a week? It's to make factories to make plastic flamingos to sell in Wal-Mart".[16] But just a bit, and largely because China has passed far beyond plastic flamingos. Its drive to become the world's manufacturing center has driven it far up the "value chain," to the point where it now, quite inescapably, competes on almost every front. Which is why the

Chinese power sector, following the larger trajectory of the Chinese economy, is booming at a sustained rate of over 30 Gigawatts, and more recently by over 50 Gigawatts, per year.[17] Why China's emissions are rising to the point where they even threaten gains being made elsewhere.[18]

The point here is not to "blame" China for the climate crisis, but to point out that despite China's aggressive commitment to an export-led development model, and despite even its highly-publicized enclaves of urban wealth, it remains a relatively poor country. To see this, it's only necessary to switch the focus from Gigawatts and emissions to income itself (emissions, after all, are only a by-product of economic activity, not its goal) and to consider the income landscape in a way that reveals its salient features.

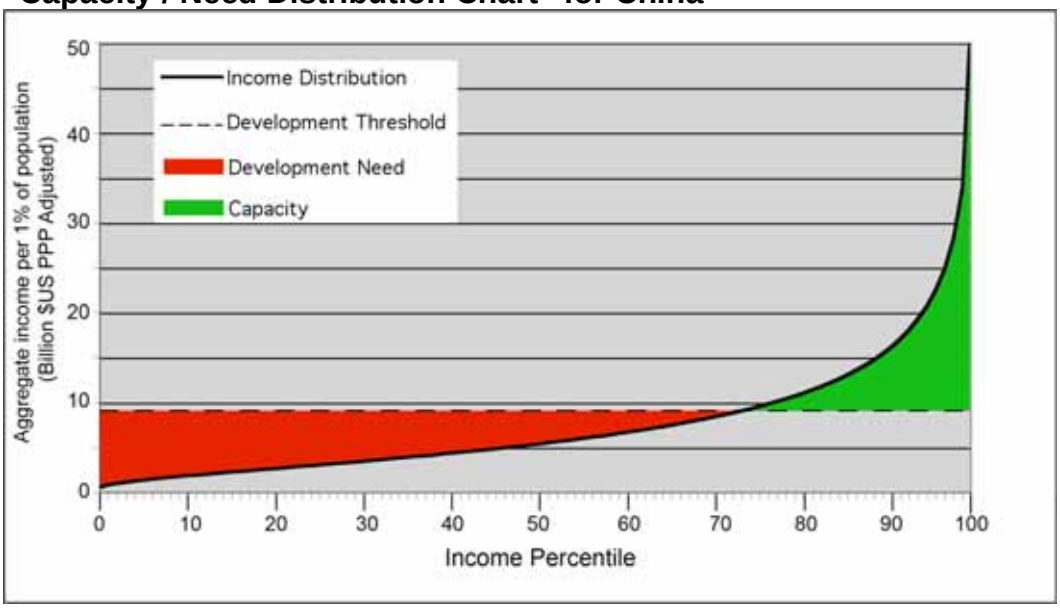
So take a look at the following charts[19], the last ones I'll trouble you with. They were designed by Paul Baer and Sivan Kartha, both scientists working on the Greenhouse Development Rights[20] project, and their goal is to name and represent, in as visually intuitive a way as possible, the national "capacity / need distributions" that are so bitterly at issue in the global climate debate.

"Capacity / Need Distribution Chart" for the United States



Capacity / Need Distribution Chart for the U.S., calculated for 2005 income data and an indicative "Development Threshold" of $US 7,000 per person per year (PPP adjusted).

“Capacity / Need Distribution Chart” for China

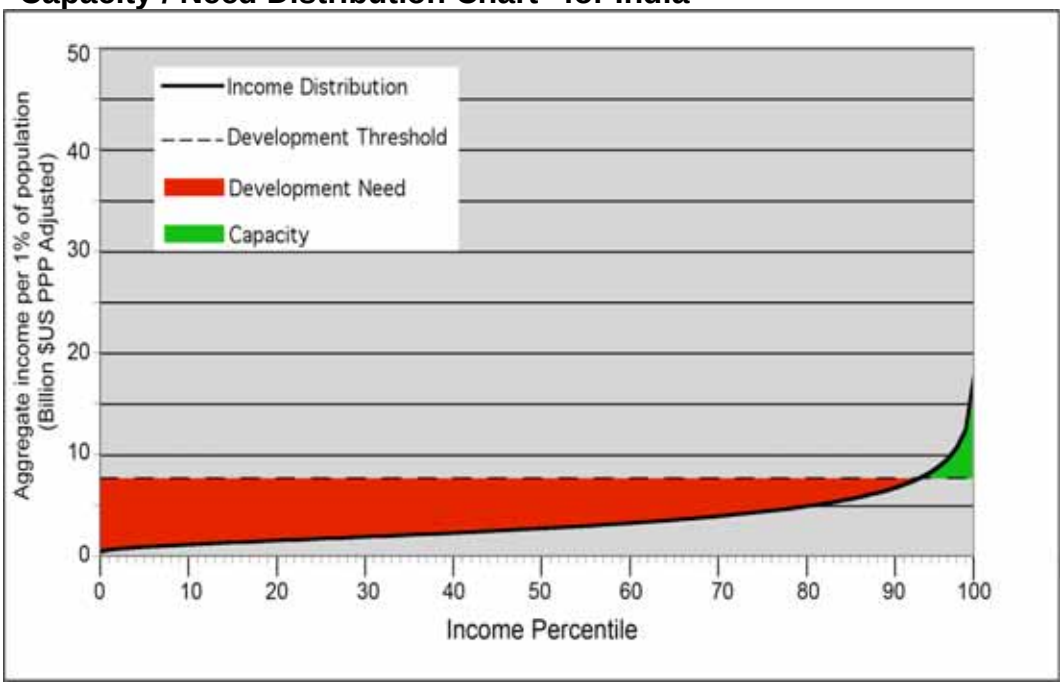


Capacity / Need Distribution Chart for China, calculated for 2005 income data and an indicative “Development Threshold” of $US 7,000 per person per year (PPP adjusted).

These “Capacity / Need Distribution Charts” show both a country’s “capacity” and its “development need,” distributed across income percentiles and relative to a “development threshold” that approximates a “global middle-class standard” of life. This development threshold is taken, for illustrative purposes, as being $US 7,000 per person per year, PPP adjusted. Thus, a country’s capacity / need distribution is defined by the income required to “develop” its entire population (shown as a horizontal line that marks an aggregate income of $US 7,000 times the national population) and an intersecting curve that represents the national income distribution. The green area above the development threshold represents the nation’s capacity, and is indicative of its ability to pay for human development, adaptation, or (of course) climate mitigation. Below it, in red, you see the national “development need,” the amount that it would take, as Martin Luther King used to say, to “lift up” all the people, at least to the relatively minimal standard of life defined by the indicative $7,000 development threshold.

Note well the two stories told by these two graphs, for they are different indeed. The obvious point is that China, as noted above, is still relatively poor. It’s capacity is small when compared to its own development need, and very small when compared to the capacity of the U.S., which is far higher in both absolute and per-capita terms. And China, please note, is hardly the extreme case – India, to give another critical example, has a capacity that’s only about 1/100th the size of its development need! Here, for a quick comparison, is its capacity / need chart:

"Capacity / Need Distribution Chart" for India



Capacity / Need Distribution Chart for India, calculated for 2005 income data and an indicative "Development Threshold" of $US 7,000 per person per year (PPP adjusted).

The point? That despite all excellent criticisms of the export-led development model (and they are many), the South's priority will remain development for some time. That, all else being equal, its emissions will continue to rapidly rise. Which is not to say that India does not have its responsibilities, or that China shouldn't step up its (already real) pursuit of efficiency and mitigation, but only that it would be entirely unrealistic to expect either country to prioritize climate mitigation at the expense of economic growth. That's just not how this world works, and even the threat of catastrophe – a threat that is real and distinctive in both China and India – will change this in time.

Which of course means that all else must not remain equal. That if we actually intend to avoid a catastrophe, then the Chinese – and the Indians, and the South Africans, and the Brazilians, and the Mexicans, and the Indonesians, and all the rest of the people of the "big poor countries," at a minimum – are going to have to embark, in good and earnest faith, on a crash program of economic decarbonization. And that (here's the inconvenient truth) *this is only going to happen if the rich countries pay the costs of that crash program*. And that this, in turn, requires the climate regime to not only drive efficiency and clean technology, but also to enable human development and poverty alleviation, and by so doing gain friends, and momentum, throughout the world.

What would this mean in practice? Here's the one-line version: *The South, which has lost the opportunity to develop along the fossil-intensive path pioneered by the North, must be guaranteed the right to develop in a new way, a way that's consistent with the imperative of stabilizing the climate system.* This, moreover, is not fundamentally an ethical claim, but a realist one. Something like this "greenhouse development right" is

needed if we're to break the global impasse over developmental equity in a climate constrained world.

And this is the real inconvenient truth.

Justice as realism

Climate change is now manifestly an emergency, but the dramatic response we need is nowhere on the horizon. Instead, and despite a thickening flurry of efforts designed to find ways forward, the international drive for a viable global climate regime is settling into a terrible impasse. This impasse, moreover, will not be broken without active U.S. leadership. That, as any realist will gladly tell you, is still how the world works.

Thus, the problem: before the U.S. can hope to provide such leadership it will have to accept its proper obligations within an international regime that takes due account of not only the scale and severity of the climate threat, but also the realities of unequal development and the imperatives of poverty alleviation. For the U.S. is, above all else, rich. And if the rich world does not provide what Gao Feng, the former head of the Chinese negotiating team once called "the ways and means" to reduce carbon emissions in the developing world, there isn't going to be a global regime at all.

The focal issue is not actually the climate crisis, but rather the climate crisis as it comes to us on this bitterly divided planet, and the consequent need for the rich nations to fund and otherwise support mitigation efforts in the developing world. This issue has recently been widely recognized. Even the UK's celebrated Stern Review, which worked hard (too hard, actually) to be realistic, made a point of arguing that the rich world would have to pay for decarbonization in the developing world:

> "There is no single formula that captures all dimensions of equity, but calculations based on income, per capita emissions and historic responsibility all point to developed countries taking responsibility for emissions reductions of at least 60% from 1990 levels by 2050."

It's clear from the context, by the way, that this means "taking responsibility for **global** emissions reductions."[21] It has to. Because if the rich countries don't take such responsibility, then, frankly, their domestic clean-energy campaigns will prove largely futile, for the very simple reason that the bulk of new emissions will be coming from the developing world.

It's a tough problem, not least because the climate crisis is only part of it. The larger part, as always, is the problem of economic justice. Still, the climate crisis will concentrate our efforts, and our minds. It will do so because it demands a new kind of realism, one that allows us the space and possibility to succeed, one that allows us to rise to the occasion. And this must be its first postulate: only global solidarity can offer a sufficient basis for the global co-operation we need. Without it, nothing will be possible. Without it, nothing will work.

Are the American people ready? Will we accept, and even embrace, a new vision of America's role in the world? I believe that we will, and that the climate crisis will help us to do so. For surely we're not naïve enough to believe that either peace or sustainability is possible without justice, or that justice does not make its own demands. The challenge now, as Howard Dean put it, is to explain that "moral values are an important part of foreign policy." This claim, moreover – and this is broadly understood, though rarely argued – has a great deal to do with the climate crisis. Which is exactly why the key will now be to articulate the moral challenges of the climate crisis, and to link these to the other crises now all around us. To do so, we have to focus on the links that bind the climate crisis to that of rising economic inequality, for this, really, is the essential fact of modern political life. If we're to succeed, we have to recognize this, and stop trying to finesse the simple truth: Only by attacking climate and inequality together can we hope to find a new solidarity for the 21st Century, and thus a way forward.

- Tom Athanasiou, January 18, 2007 *

* Thanks to Paul Baer of EcoEquity for lots of help with the quantitative aspects of this analysis, and to both Paul and Sivan Kartha of the Stockholm Environment Institute for the help with the overall analytic framework and feedback on the text.

[1] James E. Hansen, *Can We Still Avoid Dangerous Human-Made Climate Change?*, a presentation given Feb. 10, 2006, at the New School University's Social Research Conference, New York. See http://www.columbia.edu/~jeh1 for the PDF and accompanying slides. For a more formal analysis, see James Hansen, Makiko Sato, Reto Ruedy, Ken Lo, David W. Lea, and Martin Medina-Elizade, "Global Temperature Change," Proceedings of the National Academy of Sciences of the United States of America, contributed July 31, 2006 and published online on September 31, 2006. Open access download at http://www.pnas.org/cgi/reprintframed/0606291103v1?

[2] See for example, Hansen, et. al. op. cit: "If global warming is not limited to <1°C [from the present temperature] feedbacks may add to BAU emissions, making a ''different planet," including eventual ice-free Arctic, almost inevitable."

[3] For an authoritative review of the issues around sea-level rise, see *Ice Sheets and Sea Level Rise: Model Failure is the Key Issue*, by Princeton's Michael Oppenheimer. At http://www.realclimate.org/index.php/archives/2006/06/ice-sheets-and-sea-level-rise-model-failure-is-the-key-issue/ - more-315

[4] A recent study found that one of the most reliable predictors of civil war is lack of rain, so the threat here is particularly acute in Africa. Rainfall in the sub-Saharan region has declined 25 percent in the last 30 years, and the number of food emergencies in Africa each year has tripled since the mid-1980s. Says policy analyst Francis Kornegay in Johannesburg, South Africa: "You have climate change and reduced rainfall and shrinking areas of arable land; and then you add population growth and you have the elements of an explosion." Scott Baldauf, "Africans are already facing climate change," Christian Science Monitor November 6, 2006. See also Stephen J. Dubner and Steven D. Levitt, "The Price of Climate Change," New York Times Magazine, November 5, 2006.

[5] The book is *The Revenge of Gaia*. This "sustainable retreat" rap is also in Andrew Revkin's "A Conversation With James E. Lovelock: Updating Prescriptions for Avoiding Worldwide Catastrophe," published in the New York Times on September 12, 2006.

[6] The calculations shown in this paper are from Baer, Paul and Michael Mastrandrea, 2006. *High Stakes: Designing emissions pathways to reduce the risk of dangerous climate change.* Institute for Public Policy Research, London, Available at http://www.ippr.org. This study takes account of and seeks to combine the best existing uncertainty estimates for climate sensitivity, ocean heat uptake, land-use emissions, the carbon sink, and aerosol cooling. Similar results have also been demonstrated by Malthe Meinshausen in his "On the Risk of Overshooting 2ºC," in *Avoiding Dangerous Climate Change*. H. J. Schellnhuber, W. Cramer, N. Nakicenovic, T. Wigley and G. Yohe, eds. Cambridge, UK, Cambridge University Press, available online at http://www.defra.gov.uk/environment/climatechange/internat/dangerous-cc.htm.

[7] These calculations (see note 6 above) are made with rigorous probabilistic techniques that require as an input subjective expert opinion about the uncertainty of various parameters. Because there are a range of reasonable assumptions that can be made about key parameters, the calculated risk must be reported as a range.

[8] For much more on the Stern Review, see *The Worth of an Ice Sheet* by EcoEquity's Research Director Paul Baer, at http://www.ecoequity.org/docs/WorthOfAnIceSheet.pdf. Baer's argument, in a nutshell, is that Stern's treatment of "catastrophic damages" clearly fails to reflect any reasonable treatment of catastrophic risks like starting the irreversible melting of the Greenland Ice Sheet, that he therefore has in no way established the "marginal benefits" of reductions to concentrations below 450 ppm CO_2, and that his effective dismissal of the widely endorsed "2ºC limit" can therefore be rejected on his own cost-benefit terms. Note that this critique does not, in principle, invalidate Stern's chief claim – that the cost of the impacts of unmitigated warming would be far higher than the costs of mitigation – though it does make the story a bit more complicated.

[9] Personal communication (December 26, 2006). To follow it up, see pp. 68 to 75 of *Hell and High Water: Global Warming--the Solution and the Politics--and What We Should Do* (William Morrow, 2006). The issue here is known by scientists as "carbon cycle feedbacks." As in "There appears to be a threshold beyond which it becomes more and

more difficult for us to fight the feedbacks of the carbon cycle with strong energy policies that reduce fossil fuel emissions into the air." (p 73).

[10] Joe Romm is excellent on this point. See *Hell and High Water*, op cit.

[11] Many of the ideas in this essay were developed collectively within EcoEquity, the small activist think tank of which the author is a principal. Note, in particular, that EcoEquity has been working for years to develop a policy framework adequate to the climate challenge, and that, together with England's Christian Aid and staff from the Stockholm Environment Institute, we're now in the process of rolling one out. We call it "Greenhouse Development Rights." For (much) more on this evolving story, see http://www.ecoequity.org/GDRs or, more particularly, the paper which we prepared for the recent Nairobi meeting of the climate negotiations: *Greenhouse Development Rights: An approach to the global climate regime that takes climate protection seriously while also preserving the right to human development.* It can be downloaded at http://www.ecoequity.org/GDRs/GDRs_Nairobi.pdf.

[12] The term "atmospheric space" is a variant of "environmental space," a term introduced some years ago by analysts associated with Friends of the Earth International. See for example Michael Carley and Philippe Spapens, *Sharing the World: Sustainable Living and Global Equity in the 21st Century*, 1998, Earthscan.

[13] The classic text is Peter Hayes and Kirk Smith, editors, The *Global Greenhouse Regime: Who Pays?*, 1993 United Nations University Press and Earthscan.

[14] "China to Pass U.S. in 2009 In Emissions," Keith Bradsher, *The New York Times*, November 7, 2006.

[15] The projection here was developed as part of the quantitative analysis supporting the Greenhouse Development Rights project. For more information, contact Paul Baer, pbaer@ecoequity.org.

[16] "Terry Tamminen: Democratic Congress and Republican sincerity," interview with David Roberts, January 8, 2007, http://gristmill.grist.org/story/2007/1/8/103722/0219

[17] Nor is this growth expected to abate soon. And China, unfortunately, has a great deal of cheap, dirty coal, and very little low-carbon energy. Natural gas is not in great supply, and even Three Gorges, China's highly-contested foray into mega-hydro, will only produce about 21 Gigawatts, less than half of one year's growth. Figures are from Jim William's "Developments in Asian Electricity: Reform, Politics, Environment," U.C. Berkeley, February 25, 2005.

[18] A good source for the canonical data, as time goes by, is the U.S. Energy Information Administration. See http://www.eia.doe.gov/environment.html and click the "Total Emissions" link to get a current spreadsheet.

[19] The "Capacity / Need Distribution Charts" here have been developed as part of the quantitative analysis supporting the Greenhouse Development Rights project. They are based on the simplifying assumption that the income distribution of a country can be approximately represented by a lognormal distribution, using per capita income and the Gini coefficient as the specific parameters. For more information, contact Paul Baer, pbaer@ecoequity.org.

[20] See note 11 above.

[21] This quote is in the long version of the executive summary, and also chapter 22, "Creating a Global Price for Carbon." For the context, see especially page 460 in section 21.4: "Building and sustaining coordinated global action on climate change," which talks explicitly about developed country financing for emissions reductions in the developing world.