Second Edition Executive Summary, September 2008:

The right to development in a climate constrained world

The Greenhouse Development Rights Framework*

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A climate framework designed to support an emergency climate stabilization program while, at the same time, preserving the right of all people to reach a dignified level of sustainable human development free of the privations of poverty

A warming of 2°C over pre-industrial has been widely endorsed as the maximum that can be tolerated or even managed. Yet even as the emerging science1 increasingly underscores how extremely dangerous it would be to exceed 2°C, many people are losing all confidence that today's inertial, politics-bound societies will be able to prevent such a warming. Our quite different conclusion is that the 2°C line can indeed be held, but that doing so demands a sharp break with politics as usual. Accordingly, we follow the science, defining a global emissions objective – a "2°C emergency pathway" – that preserves a real chance of holding the 2°C line, and then setting out to straightforwardly assess the strategies and accommodations that will be necessary to do so. More specifically, since carbon-based growth is no longer a viable option in either the North or the South, we set out to assess the problem of rapid decarbonization in world, sharply polarized between North and South and, on both sides, between rich and poor.

A simple thought experiment, illustrated in this first figure, makes the situation clear. In this figure, we show a scientifically realistic assessment of the size of the remaining global carbon budget (the 2°C emergency pathway, shown in red), along with the portion of that budget that the wealthy Annex 1 countries would consume *even if they undertake bold efforts to virtually eliminate their emissions by 2050* (as shown in

* The Greenhouse Development Rights homepage: http://www.ecoequity.org/GDRs
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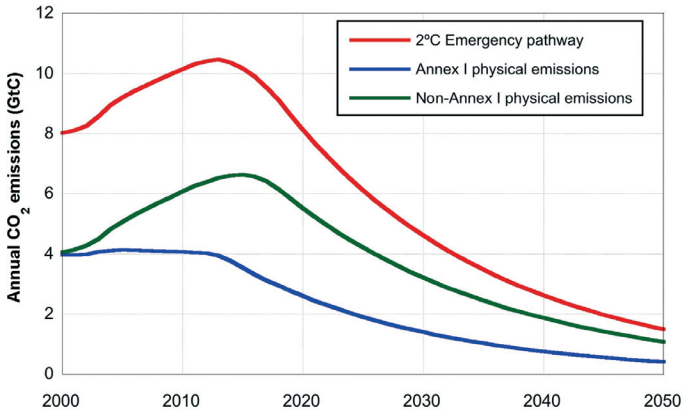
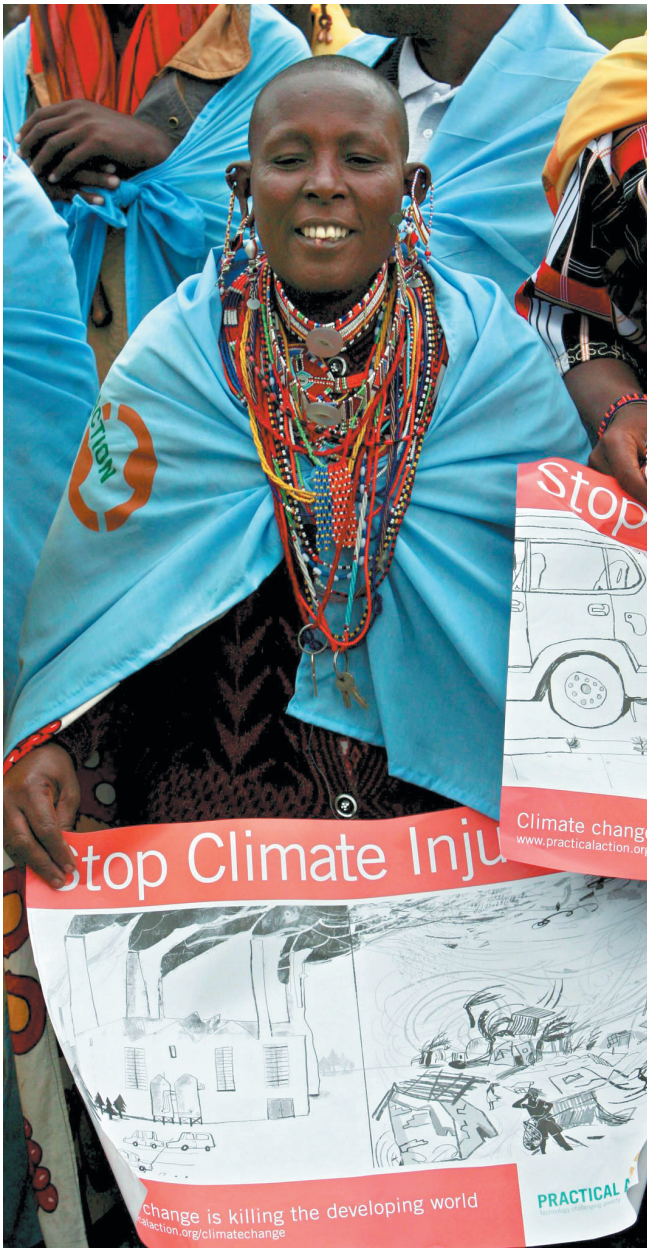


Figure ES1. The South's Dilemma. The red line shows the 2°C Emergency Pathway, in which global CO2 emissions peak in 2013 and fall to 80 percent below 1990 levels in 2050. The blue line shows Annex 1 emissions declining to 90 percent below 1990 levels in 2050. The green line shows, by subtraction, the emissions space that would remain for the developing countries.



A Maasai women dances while holding a banner saying "Stop climate injustice" at a demonstration in Nairobi, Kenya, on Saturday 11 November, 2006. More than 5.000 people braved the rain to march in support of initiatives to combat global warming, the first of its kind to be held in Africa, to coincide with the United Nations Climate Change Conference being held in the country until 17 November.

blue). Doing so reveals, by subtraction, the alarmingly small size of the carbon budget (shown in green) that would remain to support the South's development.

A few details only make the picture starker:

- The efforts implied by this 2°C emergency pathway are heroic indeed. Global emissions peak in 2013 and decline to 80 percent below 1990 levels by 2050, such that CO_2 concentrations can peak below 420 ppm and then begin to fall[2]. Yet even this would hardly mean that we were "safe." We would still suffer considerable climate impacts and risks, and a roughly 15-30% probability of overshooting the 2°C line.[3] This is what the IPCC would refer to as a trajectory that was "likely", but not "very likely" to keep warming below 2°C.

- The Annex 1 emission path shown here is more aggressive than even the most ambitious of current EU and US proposals. It has emissions declining at nearly 6 percent annually from 2010 onwards, and ultimately dropping to a near-zero level. It's a tough prospect, and if it is politically plausible at all, it is just barely so.

- And, still, the space remaining for the developing world would be extremely constrained. In fact, developing country emissions would still have to peak only a few years later than those in the North – before 2020 – and then decline by nearly 6 percent annually through 2050. And this would have to take place while most of the South's citizens were still struggling in poverty and desperately seeking a significant improvement in their living standards.

It's this last point that makes the climate challenge so daunting. For the only proven routes to development – to water and food security, improved health care and education, secure livelihoods – involve expanding access to energy services, and, given the South's sharply limited access to low-carbon energy technology, an inevitable increase in fossil fuel use and thus carbon emissions. From the South's perspective, this pits development squarely against climate protection. And with even the minimal *Millennium Development Goals* being treated as second-order priorities, the developing countries are quite manifestly justified in fearing that the larger development crisis, too, will be treated as secondary to the imperatives of climate stabilization. The level of international trust is very low indeed and, all told, the situation invites global political deadlock.

And, despite progress at the margins, the climate negotiations are moving far, far too slowly. It's unlikely that we will be able to act, decisively and on the necessary scale, until we openly face the big question: *what kind of a climate regime can allow us to bring global emissions rapidly under control, even while the developing world vastly scales up energy services in its ongoing fight against endemic poverty and for human development?*

The Development Threshold

Development is more than freedom from poverty. The real issue is sustainable human development, and the right to such development must be acknowledged and protected by any climate regime that hopes for even a chance of success. The bottom line in this very complicated tale is that the South is neither willing nor able to prioritize rapid emissions reductions, not while it must also seek an acceptable level of improvement in the lives of its people. And that the key

to climate protection is the establishment of global burden-sharing regime in which it is not required to do so.

The *Greenhouse Development Rights* framework (GDRs) is, accordingly, designed to protect the right to sustainable human development, even as it drives rapid global emissions reductions. It proceeds in the only possible way, by operationalizing the official principles of the UN's *Framework Convention on Climate Change*, according to which 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."

As a first step, the GDRs framework codifies the right to development as a "development threshold" – a level of welfare below which people are not expected to share the costs of the climate transition. This threshold, please note, 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, it is set to be higher than the "global poverty line," to reflect a level of welfare that is beyond basic needs but well short of today's levels of "affluent" consumption.

People below this threshold are taken as having development as their proper priority. As they struggle for better lives, they are not similarly obligated to labor to keep society as a whole within its sharply limited global carbon budget. In any event, they have little responsibility for the climate problem and little capacity to invest in solving it. People above the threshold, on the other hand, are taken as having realized their right to development and as bearing the responsibility to preserve that right for others. They must, as their incomes rise, gradually assume a greater faction of the costs of curbing the emissions associated with their own consumption, as well as the costs of ensuring that, as those below the threshold rise towards and then above it, they are able to do so along sustainable, low-emission paths. Moreover, and critically, these obligations are taken to belong to all those above the development threshold, whether they happen to live in the North or in the South.

The level where a development threshold would best be set is clearly a matter for debate. We argue that it should be at least modestly higher than a global poverty line, which is itself about $16 per day per person (PPP adjusted)[4]. This figure derives from an empirical analysis of the income levels at which the classic plagues of poverty – malnutrition, high infant mortality, low educational attainment, high relative food expenditures – begin to disappear, or at least become exceptions to the rule. So, taking a figure 25 percent above this global poverty line, we do our "indicative" calculations relative to a development threshold of $20 per person per day ($7,500 per person per year). This income also reflects the level at which the southern "middle class" begins to emerge.

National obligations and the "Responsibility-Capacity Index"

Once a development threshold has been defined, logical and usefully precise definitions of *capacity* and *responsibility* naturally follow, and these can then be used to calculate the fraction of the global climate burden – however large it may be and however it is conceived (an ecological debt, an obligation to invest in critical but unprofitable mitigation projects, a responsibility to support adaptation) – that should fall to any given country.

Capacity, by which we mean income not demanded by the necessities of daily life, and thus available to be "taxed" for investment in climate mitigation and adaptation, can be straight-forwardly interpreted as total income, *excluding income below the development threshold*. A nation's aggregate capacity, then, is defined as the sum of all individual income, excluding income below the threshold. Responsibility, by which we mean contribution to the climate problem, is similarly defined as cumulative emissions since 1990, excluding emissions that correspond to consumption below the development threshold. "Development emissions," like "development income," do not contribute to a country's obligation to act to address the climate problem.

Thus, both capacity and responsibility are defined in individual terms, and in a manner that takes explicit account of the unequal distribution of income within countries. This is a critical and long-overdue move, because the usual practice of relying on national per-capita averages fails to capture either the true depth of a country's developmental urgency or the actual extent of its wealth. If one looks only as far as a national average, then the richer, higher-emitting minority lies hidden behind the poorer, lower-emitting majority.

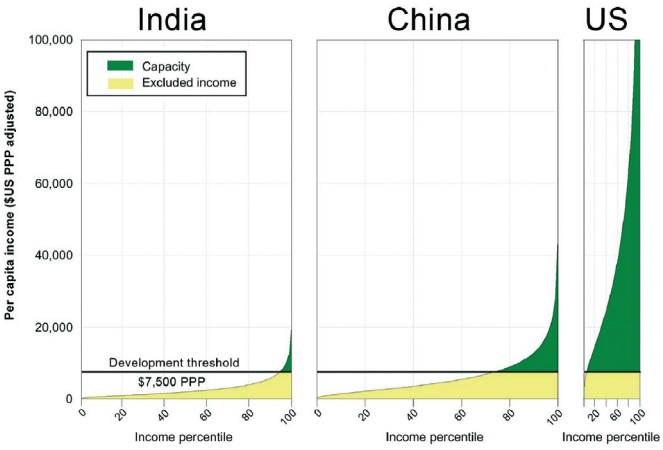


Figure ES2: Capacity: income above the development threshold. These curves approximate income distributions within India, China, and the US. Thus, the green areas represent national incomes above the ($20 per person per day, PPP) development threshold, our definition of national capacity. Chart widths are scaled to population, so these capacity areas are correctly sized in relation to each other.

These measures of capacity and responsibility can then be straightforwardly combined into a single indicator of obligation: a "Responsibility Capacity Index" (RCI). This calculation is done for all Parties to the UNFCCC, based on country-specific income, income distribution, and emissions data. The precise numerical results depend, of course, on the particular values chosen for key parameters, such as the year in which national emissions begin to count towards responsibility (we use 1990, but a different starting date can be defended) and, especially, the development threshold, which defines the overall "progressivity" of the system. They also vary over time – as the following table shows, the global balance of obligation in 2020, or 2030[5], can be expected to differ considerably from that which exists today.

What's most important is that the GDRs framework lays out a straightforward operationalization of the UN's official differentiation principles, and that it does so in a way that protects the poor from the burdens of climate mobilization. Beyond that, the values of specific parameters can be easily adjusted and should certainly be debated; all of them, of course, would have to be negotiated.

Still, for all that, our indicative calculations are well chosen and interesting. Looking at just the 2010 numbers, for

	Percentage of global total (2010)						
	Population %	GDP	Capacity %	Responsibility %	2010 RCI %	2020 RCI %	2030 RCI %
United States	4.5	20.9	29.7	36.4	33.1	29.1	25.4
EU (27)	7.3	22.4	28.8	22.6	25.7	22.8	19.6
Germany	1.2	4.2	5.6	5.3	5.5	4.7	4.0
China	19.7	11.7	5.8	5.2	5.5	10.4	15.3
India	17.2	4.9	0.7	0.3	0.5	1.2	2.3
South Africa	0.7	0.7	0.6	1.3	1.0	1.1	1.2
LDCs	11.7	1.5	0.11	0.04	0.07	0.1	0.12
Annex 1	18.7	58.3	75.8	78.0	76.9	69.0	60.9
Non-Annex 1	81.3	41.7	24.2	22.0	23.1	31.0	39.1
High Income	15.5	56.9	76.9	77.9	77.4	69.3	61.1
Mid Income	63.3	39.7	22.9	21.9	22.4	30.4	38.5
Low Income	21.2	3.4	0.2	0.2	0.2	0.3	0.5
Global Total	100%	100%	100%	100%	100%	100%	100%

Table ES1. Percentage shares of total global population, income, capacity, cumulative

example, they show that the United States, with its exceptionally large share of the global population of people with incomes above the $20 per day development threshold (capacity), as well as the world's largest share of cumulative emissions since 1990 (responsibility), is the nation with the largest share (33.1 percent) of the global RCI. And that the EU follows with a 25.7 percent share. And that China, despite being relatively poor, is large enough to have a rather significant 5.5 percent share, which puts it even with the much smaller but much richer country of Germany. And that India, also large but much poorer, falls far behind China with a mere 0.5 percent share of the global obligation to act.

As the table shows, the global balance of obligation changes over time, as differing rates of national growth change the global income structure. The results are most obvious, and startling, in the projected change in China's share of the total RCI, which – reflecting its extremely rapid growth and the increasing number of Chinese people who are projected to enjoy incomes above the development threshold – nearly triples (from 5.5% to 15.3%) in the two decades from 2010 to 2030.

These figures, again, illustrate the application of the GDRs framework by way of an particular choice of key parameters. Note that in this indicative calculation, we've made the rather conservative assumption that all income (and all emissions) above the development threshold count equally toward the calculation of an individual's RCI. This amounts to a "flat tax" on capacity and responsibility. However, it might be more consistent with widely shared notions of fairness for RCI to be defined in a more "progressive" manner. That is, an individual's millionth dollar of income might contribute more to their RCI than the their ten-thousandth dollar of income. A more progressive formulation of RCI would shift more of the global burden to wealthy individuals and wealthy countries.

However, regardless of the particulars of any example quantification, the GDRs framework, or any approach to differentiating national obligations that is designed to ensure a meaningful right to development, would be a real game changer. For one thing, it would allow us to objectively and quantitatively estimate national obligations to bear the burdens of climate protection (obligations to support adaptation as well as obligations to mitigate) and to meaningfully compare obligations even between wealthy and developing countries. Using the terminology of the Bali Roadmap, it would allow us to gauge the "comparability of effort" across countries. Another way of putting this is that it would allow us to escape the Annex 1 / Non-Annex 1 divide, which has become a significant obstacle to the progress of the negotiations. For example, in a GDRs style system, debates about whether Saudi Arabia or Singapore should "graduate to Annex 1" would be entirely unnecessary; both would simply be countries with obligations of an appropriate scale, as specified by their RCIs.

But the real value of this approach is that it defines and quantifies national obligations in a way that explicitly safeguards a meaningful right to development. It takes at face value the developing country negotiators' claim that they can only accept a regime that protects development, and just as importantly it tests the willingness of the industrialized countries to step forward and offer such a regime.

Operationalizing a GDRs burden-sharing framework

How might such obligations be operationalized? Consider two complementary examples. First, imagine a single grand international fund to support both mitigation and adaptation – akin to, say, the Multinational Climate Change Fund proposed by Mexico. The RCI could serve as the basis for determining each nation's obligatory financial contribution to that fund. So, for example, if the annual climate transition funding requirement amounted to a trillion dollars (about one and a half percent of Gross World Product), then in 2010, the US, with its 33.1 percent of the global RCI, would be obligated to pay about $331 billion. Similarly, the EU's share would be $257 billion (25.7% of the global RCI), China's share would be $55 billion (5.5%), India's share would be $5 billion (0.5%), and so on. The RCI, in effect, serves as the basis of a progressive global "climate tax" – not a carbon tax, per se, but a *responsibility* and *capacity* tax.

There are, of course, ways of thinking about global burden sharing that do not focus on national financial obligations. The most important is emissions reductions driven by way of Kyoto-style national targets. These we approach by comparing a global reference trajectory to the rapidly declining 2°C emergency pathway, a comparison that allows us to straightforwardly calculate the total amount of mitigation (in, say, gigatons of carbon) that is needed globally in any given year. Applying the GDRs framework, national reductions obligations are defined as shares of the global mitigation

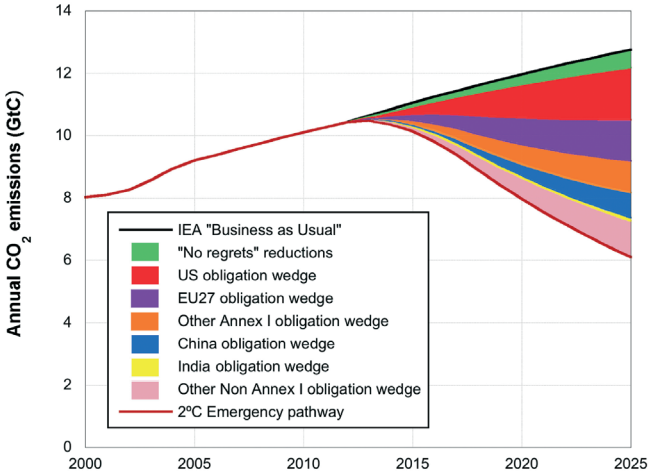


Figure ES3. Total global mitigation requirement, divided into "national obligation wedges." Shows the shares that would be borne by particular nations (or groupings) in proportion to their share of the total global RCI.

requirement, which is allocated among countries in proportion to their RCI. The US, for example (see the following figure) is projected to have a 2020 reduction obligation equal to 29.1% of the roughly 4 GtC of mitigation that will then be needed. In general, each country is given an emission target equal to its reference trajectory minus its proportional share of the global mitigation requirement.

Distributing the global mitigation requirement in this way yields some striking results. For one thing, it shows, with startling clarity, that a major commitment to North-South cooperation – including financial and technological transfers – is an inevitable part of any viable climate stabilization architecture. This is because the national mitigation obligations of the high-RCI countries of the North vastly exceed the reductions they could conceivably make at home. In fact, by 2030, their mitigation obligations will typically come to exceed even their total domestic *emissions*! Which is to say that wealthier and higher emitting countries would be given "negative allocations," as is necessary in order to open enough atmospheric space for the developing world.[7]

Thus, (see the following figure), US emissions are projected in its reference case to be about 1640 megatons of carbon (MtC) in 2025, yet in that same year its overall emissions reduction obligation would be 1620 MtC. This implies a 99 percent reduction target, not all of which can be realized at home. The rest the US must make in other countries, by way of reductions that are "supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner."[8]

This situation reflects the nature of national obligations and the obvious truth of the greenhouse world: even if the wealthy countries reduce their domestic emissions to zero or near-zero levels, they must still enable large emissions reductions elsewhere – in countries that lack the capacity (and responsibility) to reduce emissions fast enough and far enough, at least without significant assistance from others. Which is to say that much of the mitigation that takes place within southern countries must be enabled by the North.

Here, we show domestic reductions that, though extremely ambitious (the US share of the same rapidly declining trajectory illustrated for Annex 1 in the first figure above) still satisfy only about half of the US's total obligation. The remainder, about 750 MtC of reductions in 2025, must be made in other countries. In contrast, China, obligated to 2025 reductions of about 900 MtC, would be able to make them all domestically, even as another large quantity of reductions within China, about 600 MtC in 2025 in this indicative calculation, would be enabled and supported by other high-RCI countries.

Thus, in developing countries, domestic obligations are coupled with the (typically larger) international obligations of other countries to ensure that development can proceed along a decarbonized pathway.

Towards political realism

It is easier to agree to principles than it is to operationalize them, and the Framework Convention's principles of "common but differentiated responsibilities and respective capabilities" are no exception. Moreover, operationalization is

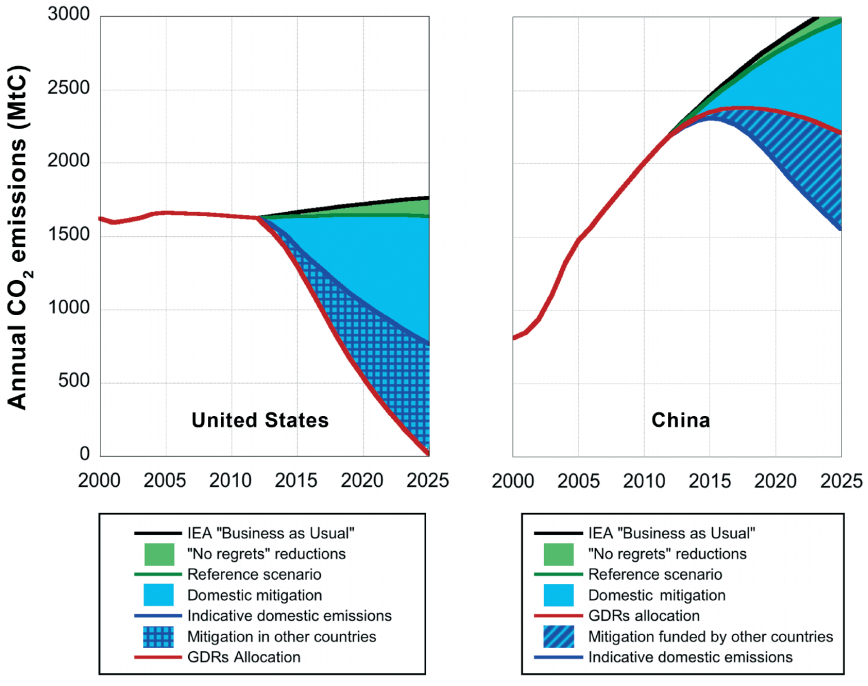


Figure ES4. US (left) and Chinese (right) obligations. No-regrets reductions are shown in green, indicative domestic reductions in light blue. The US's additional, internationally discharged reduction obligation is shown with dark blue hatching (left panel). Conversely, mitigation that takes place in China but is funded by other countries is shown with dark blue stripes (right panel).

bound to be particularly difficult if, as the Greenhouse Development Rights analysis shows, it requires powerful countries to accept large obligations, and to commit to making large international financial and technology transfers.

Yet it is time to be frank. In general, the size of the international transfers implied by the GDRs analysis are not consequences of its burden-sharing architecture, but rather of the emergency 2°C transition that the GDRs approach seeks to help drive forward. Were we to run the same analysis with a much weaker temperature target, the results would be far less daunting. Which is to say that the size of the financial and technology transfers implied by the GDRs analysis are in largest part the consequences of past delay, of decades of denial that now must surely end.

Moreover, Bali clearly revealed the South's unremitting insistence on linking international financial and technology transfers and the "nationally appropriate mitigation actions by developing country parties" that are now so critically and manifestly necessary. There is simply no longer any way to responsibly deny this linkage, not even in the U.S., where frank talk of America's international obligations is widely seen as an explosive threat to critical domestic action. In this context, the GDRs approach may actually be quite helpful, because it stresses the need for a system in which it's not "the North," but rather the affluent and consuming classes, that bear the burdens of the climate transition.

This reframing is not merely ethical. For while commitments from the South's consuming classes are certainly appropriate for reasons of elementary justice, the politics here are yet more pressing. To be blunt, it is extremely unlikely that the working consensus needed in the North, a consensus to pay its "fair share" of the world's total mitigation and adaptation costs, could ever emerge if the wealthy minority in India and China and other developing nations are not also paying their fair shares. The GDRs framework is, above all else, an effort to transparently specify what those "fair shares" would be, and to do so in a manner that acknowledges and respects a meaningful right to development.

Still, one can reasonably ask if an approach like this, which compounds the climate challenge with the development challenge, and by so doing makes it even more overwhelming, is at all politically realistic. Our response is to ask another question – are we yet serious about facing down the climate crisis? For as others have noted before us, the outer bound of today's realism are still far shy of the inner bounds of scientific necessity. Besides, the demands of political realism are themselves rather labile; history shows, and continues to show, that they can change with remarkable rapidity. And as the impacts of our destabilizing climate bear down upon us, it is likely that they will do just that.

The bottom line is that, without an unprecedented level of global cooperation, the 2°C emergency pathway, or anything like it, will quickly recede out of range. Climate change is a threat – perhaps humankind's first such threat – that demands cooperation, even across the rich-poor divide. This time around, the limits of enclave civilization are all too visible. There is no solution for the few. The prospects of the wealthy depend upon a meaningful level of solidarity with the poor, and increasingly they know it.

And not a bit too soon. Because the climate negotiations will not succeed unless they ensure the rights of billions of people, far away from the conference halls: the unseen poor of the planet today, and the unborn children of the future. Which, actually, makes our task clear. We have to ensure our common future by recognizing the fundamental condition of success: the North must engage with the South in a way that explicitly prioritizes the development gap between the rich and the poor. The alternative, if we may be blunt, is a weak regime with little chance of preventing catastrophic climate change.

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Endnotes

1 Lenton, T. M., Held H., Kriegler, E., et al (2008): "Tipping Elements in the Earth's climate system," Proceedings of the National Academy of Sciences. 105 (6): 1786-1793. Cambridge.

2 See Meinshausen (2006), or Baer and Maestrandera (2006). For the latest evidence that concentration ratios need to drop even below 350 ppm CO2, see Hansen (2008).

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

4 Pritchett, L. "Who is Not Poor? Proposing A Higher International Standard for Poverty", The Center for Global Development (www.cgdev.org/content/publications/detail/2758), and Pritchett, L. (2006), "Who is Not Poor? Dreaming of a World Truly Free of Poverty", The World Bank Research Observer, Vol. 21, No. 1, pp. 1-23, Spring. Pritchett concluded that the use of this line 'is justifiable, more consistent with international fairness, and is a better foundation for the World Bank's organizational mission of poverty reduction' and that 'If the poverty line were defined as the level of income at which people typically achieve acceptable levels of the Millennium Development Goal indicators (such as universal primary school completion), it would be set at about [$16] a day'

5 Our 2020 and 2030 projections are based on the International Energy Agency's 2007 World Energy Outlook reference case projections.

6 The reference trajectory is essentially a business-as-usual trajectory, including some "no-regrets" options.

7 Incidentally, this kind of negative allocation can never arise under Contraction and Convergence style trajectories, wherein high-emitting countries are only required to transition from their high grandfathered allocations down toward the global per-capita average. Greenhouse Development Rights, it should be said, evolved from Contraction and Convergence, the most well-known of the per-capita rights approaches.

8 The Bali Action Plan, Decision 1/CP.13 para 1(b)ii.