



# A Call for Leadership

*A Greenhouse Development Rights analysis of  
the EU's proposed 2020 targets*

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## Executive Summary

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An impasse threatens the international climate negotiations. This impasse – and its implications for the European Union – derives from the fundamental fact that the climate crisis confronts us in a profoundly unequal world. Moreover, the climate crisis is extremely grave; it actually requires that, somehow, we launch a global emergency mobilization to stabilize the climate. Yet such a mobilization, which would be daunting under the best of circumstances, must come while billions of people, overwhelmingly but not exclusively in the South, are still struggling to escape poverty.

This is a critical complication, greater even than those engendered by the crashing waves of financial and geo-political instability that, alas, seem to characterize our times. Its importance cannot be overstated. Nor can its most obvious implication: despite the progress that has been made since Bali – most visibly in the various financing proposals which have now been formally tabled – a further effort, and a bold one, will be needed if the impasse is to be broken in time. And this effort will have to originate in the wealthy world. It will, almost certainly, and against all odds, have to originate in Europe.

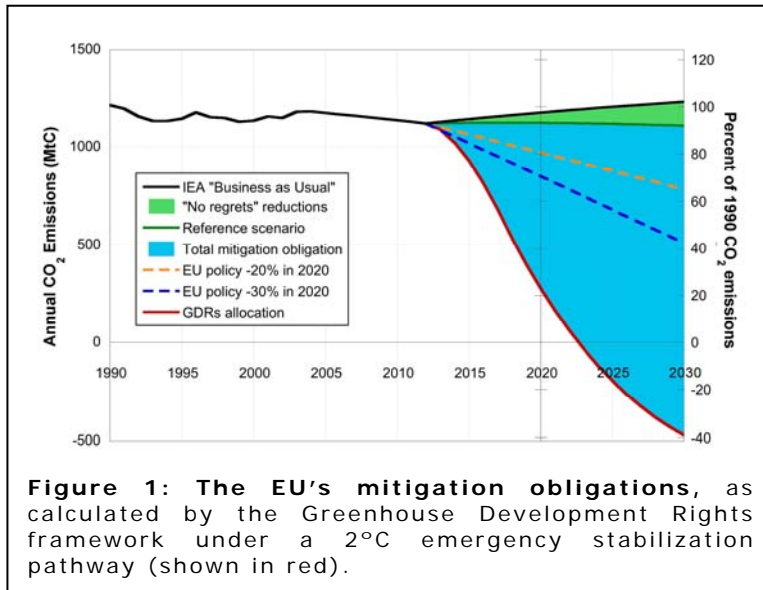
There are two big problems here. The first is that, despite helpful proposals for global funds and global auctions, they are not enough. The North / South impasse will not be broken without a fair global burden sharing architecture, one that promises a way forward that does not threaten the development of the South. The second is that the northern countries have, by and large, failed to honor their climate commitments; in particular, the financial and technological support that was promised in Rio, in Kyoto, and on many occasions since, has simply not arrived.

The first of these, the burden sharing problem, demands a major step beyond the ad hocism of the Kyoto targets, and toward a transparent, principle-based system that holds the right to development at its structural core. This is where the Greenhouse Development Rights framework comes in. GDRs (explained briefly below and in greater length in the appendices) is a burden sharing system designed to be as simple as possible while still capturing the intention behind the UNFCCC's famous principles of "common but differentiated responsibilities and respective capabilities." By incorporating responsibility, it captures the necessities of the polluter pays principle and establishes incentives for low-carbon development. By incorporating capacity, it respects the obvious truth that climate is an overarching civilizational challenge that will demand major financial resources. By defining both responsibility and capacity with respect to a development threshold, it safeguards a meaningful right to development. And, critically, by accounting for intra-national disparities in wealth, it recognizes that that this right adheres to individuals, not countries, and that the relatively wealthy people in poor countries, like their compatriots in the North, quite properly share the common obligation to stabilize and protect the global climate.

### ***The EU's proposed commitments vs. its GDRs obligations***

As with every country, the EU's mitigation obligations under the GDRs framework are calculated as a share of the global mitigation requirement, based on a combined indicator of its responsibility and capacity – a *Responsibility and Capacity Index*. By 2020, the EU's share (~23%) of the global total mitigation requirement (~3700 MtC) reaches roughly 850 MtC. (Under the GDRs framework, the EU would also have an obligation to accept 23% of the global adaptation burden, though adaptation is not discussed in detail in this brief memo.)

Figure 1 shows (the red line) the EU's mitigation obligations (its share of an emergency emissions



reduction pathway that is stringent enough to support a high probability of holding the 2°C line), relative to the EU's reference pathway. As is strikingly clear (the size of the blue wedge) the EU's GDRs allocation plummets to almost 80% below 1990 levels by 2020, and passes below zero in about 2023. This seems radical indeed when compared to the European Commission's proposed targets. The default EC target of 20% reduction below 1990 levels is shown in dashed orange, and the EC's

proposed target under an international agreement is a slightly more ambitious 30% reduction, shown in dashed blue. Clearly, a reduction obligation this large is only meaningful if it is understood as a composite, *two-fold obligation* to, on the one hand, make reductions domestically and, on the other, invest in reductions internationally. The EU, like other northern countries, has such a two-fold obligation, and under a trajectory that's actually consistent with a 2°C target, both sides of it are quite demanding indeed.

Indeed, this two-fold obligation is large enough to seem entirely implausible by today's standards of political realism. Nevertheless, obligations of this scale for countries with high capacity and responsibility are in the final analysis, quite unavoidable. It is only by way of such large obligations that a climate regime can effectively bring about two vital outcomes. First, by driving ambitious domestic reductions, ensuring that the wealthier countries free up sufficient environmental space for the poorer countries to develop. Second, by driving equally ambitious international reductions – enabled by technological and financial support from the wealthier countries – ensuring that this development occurs along a decarbonized path.

In other words, it is only by accepting this *two-fold obligation* that the wealthy countries can make the climate regime genuinely consistent with a right to development.

### ***The European Union's role as a global leader***

Europe, of course, plays and will continue to play a critical role in the global effort to create a viable climate regime. Moreover, it will do so even after the US presidential election, regardless of the winner. For despite the prospect of extremely important short-term *political* changes in the US, *substantial* policy shifts cannot really be expected to materialize before Copenhagen. In this context, the EU will have to rise to the demands of the moment, in two ways. First, even in the face of the manifest temptation to declare the 2°C target out of reach, it must reaffirm its commitment to that target, and to the *explicitly fair* accord that will be necessary if we're to meet it. Second, and even more importantly, the EU must remain, at least for the immediate future, the North's most courageous negotiator.

In particular, the EU must soon table a proposal with a level of ambition that is explicitly consistent with the 2°C target, and it must do so in a manner that helps to break the international

impasse. To that end, the EU must somehow push beyond the frozen system defined by the Kyoto Annexes, even as it recognizes the impossibility of immediately escaping them. And it must do so no matter how difficult, indeed heroic, such an effort seems.

The problem is not just the EU's internal disputes. It is also that bitter international disputes, long deferred, must now finally be faced, if there's to be any real chance of success in Copenhagen. The two big issues are "differentiation" (how, in the face of vast international economic disparities, can a global system of stringent commitments be fair?), and "sequencing" (what steps must be taken – and by whom – to lead us through the current impasse and toward that fair system?). Which is not to say that the EU must rise to impossible demands, but that it must, somehow, signal a willingness, even a unilateral willingness, to carry its proper share of the global burden of meeting the 2°C target.

In this regard, the GDRs approach is both inconvenient and useful, and for exactly the same reason: it makes plain both the size of the necessary global effort and the share of that effort that, by a straightforward and transparent accounting of capacity and responsibility, the EU would be obliged to fulfill. By so doing, it suggests a path forward, and, in the short-term, it clarifies the requirements of genuine EU leadership. There couldn't be a better time to do so. For, frankly, there are worrying signs that, instead of finding its way to leadership, the EU is balking in the face of stiffening headwinds.

The bottom line in all this is easily stated – today's policies will not meet the 2°C target. This will not do, but neither will it do for the EU to pretend that it is pursuing policies that are consistent with 2°C when, in fact, it is falling short.

# 1 The South's dilemma

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A warming of 2°C over pre-industrial has been widely endorsed as the maximum that can be tolerated or even managed. Indeed, the EU is largely responsible for establishing 2°C as the “line in the sand” that must not be crossed. It has also acknowledge, though, that even 2°C is by no means safe, as is clearly articulated by the IPCC’s Fourth Assessment Report. There is a significant if not readily quantifiable risk that a warming of even less than 2°C could trigger the irreversible melting of the Greenland and West Antarctic Ice Sheets. And, quite disturbingly, with a manifest warming of only 0.8°C, we are already seeing effects – such as the precipitous receding of the Arctic sea ice – that are not only dangerous in themselves but also producing positive feedbacks that accelerate the warming. Moreover, and significantly, the fact that they are already doing so is strong evidence that the overall sensitivity of the climate system is quite high, and that stabilization concentrations that were even recently considered to be manageably safe – 450 ppmCO<sub>2,eq</sub> for example – are in fact quite dangerous.<sup>i</sup>

Yet even as the emerging science increasingly underscores how extremely dangerous it would be to exceed 2°C, many people are losing all confidence that we will be able to prevent such a warming. Our very different conclusion is that the 2°C line can indeed be held, but that doing so demands courageous initiatives and a robust policy architecture, both of which go beyond politics as usual. Moreover, and critically, we argue that the honest recognition of how bad the situation really is, now, is a precondition to putting that architecture into place.

Accordingly, we follow the science to identifying a suitably precautionary climate objective. We do not argue for a temperature target that is lower than 2°C, though we would like to, because under current circumstances such a target would not be accepted as being policy relevant. But we do define a global emissions objective – a “2°C emergency pathway” – that preserves a real chance of keeping warming below 2°C, and then set out to straightforwardly articulate the key elements of a climate architecture that can make that pathway politically viable.

More precisely, since carbon-based growth is no longer a viable option in either the North or the South, we frame the problem as one of urgently needed decarbonization in a twice-divided world, one sharply polarized between the nations of the North and the nations of the South and, on both sides, between the rich and the poor people within those nations.

## *Forward from the “Bali Box”*

A word, here, on Box 13.7 from AR4’s Working Group III volume, which formed the basis of much of the discussion about burden-sharing at COP-13 in Bali, and which was cited in the Bali Action Plan. Specifically, we focus on the most stringent of the scenario families that were evaluated by the IPCC and termed the Category A scenarios:

**Box 13.7 The range of the difference between emissions in 1990 and emission allowances in 2020/2050 for various GHG concentration levels for Annex I and non-Annex I countries as a group<sup>a</sup>**

Scenario category	Region	2020	2050
A-450 ppm CO <sub>2,eq</sub>	Annex I	-25% to -40%	-80% to -95%
	Non-Annex I	Substantial deviation from baseline in Latin America, Middle East, East Asia and Centrally-Planned Asia	Substantial deviation from baseline in all regions

There’s a lot to say about this table, but the key point is that, in constructing such a table as this, all the IPCC was able to do was to inventory scenarios that were already found in the scientific

literature. And that the literature, as is now widely recognized, is embarrassingly thin on truly precautionary scenarios. This is reflected in the fact that the Category A scenarios summarized here, don't actually give a high likelihood of staying below 2°C. (On balance, they give somewhat less than a 50/50 chance). In spite of this, the table has been widely reported as "What the IPCC says the science requires," and while this was helpful in Bali, it has also helped to establish some potentially dangerous misunderstandings.

In particular, there is now a vague but widespread sense that the entire range of 25-40% for reductions in Annex I countries range is acceptable, and that "significant deviation from the baseline" might be attained by very modest developing country action. But this is not at all the case. In fact, keeping 2°C within reach means that even if Annex I emissions drop at a rate that's steep enough to bring them to the stringent edge of the 25-40% range (that is, 40% below 1990 levels in 2020), then non-Annex I emissions will need to have peaked and begun to decline by 2020. It's not just "deviations" that are at issue if we want to hold the 2°C line; by 2020, absolute reductions will need to have begun in earnest.

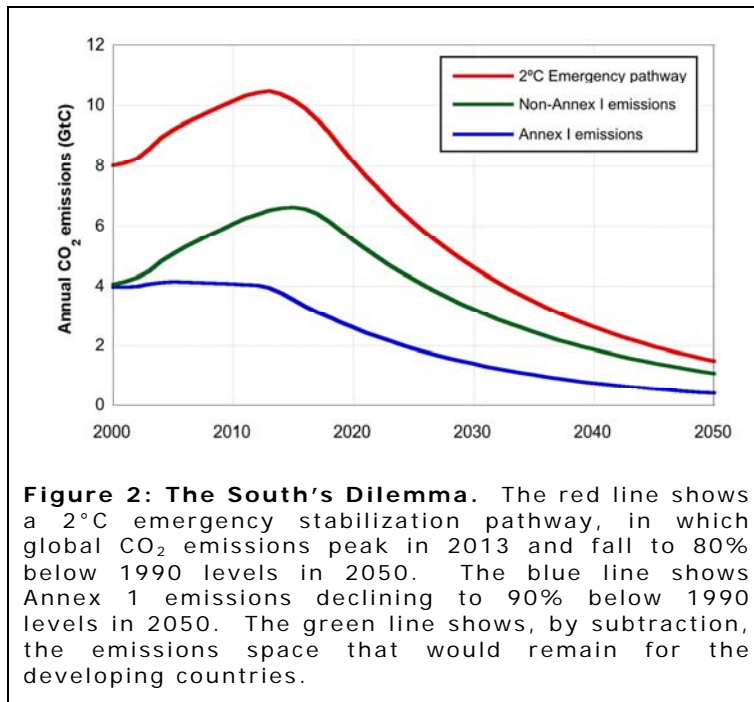
All of which needs to be closely noted as we head into the Copenhagen negotiations. For while the Bali Box, in its rollup of 450 CO<sub>2</sub>-equivalent scenarios, can be said to be an honest first draft of the emergency emissions pathway we so badly need, Copenhagen will require a second draft, and it should take major steps forward in at least two ways:

- First, the next-generation emergency pathway should not be calculated with respect to a temperature objective (less than 50% chance of keeping warming below 2°C) that is now widely recognized as being unacceptably dangerous. James Hansen and his team, in particular, have set out to make this very clear, with important recent contributions to the science of climate protection (e.g. *Target Atmospheric CO<sub>2</sub>: Where Should Humanity Aim*) that show that the IPCC's current definition of a "low-emissions target" (the 450 ppm CO<sub>2</sub>-equivalent featured in the Bali Box under Category A) would fail to leave us a planet "similar to that on which civilization developed." In particular, it would fail to stabilize the major continental ice sheets, and thus would not prevent a catastrophic rise in sea levels. The temperature implications of a "low-emission target" must, at a minimum, allow the stabilization of the Greenland and West Antarctic Ice Sheets. At this late date in the negotiations, we must adopt the discipline of making the temperature and impact consequences of proposals explicit and visible.
- Second, a reference emergency pathway should not be so vague when it comes to defining overall global emissions allowances, or indeed in specifying what "substantial deviation from baseline" in the "non-Annex I" developing world actually means. The ambiguity here allows far too much slippage and bad-faith negotiation, and it is not helpful. What is needed is enough specificity to allow a clear understanding of the effort needed, in terms of the time available before global emissions need to peak, and the rate at which they will have to decline thereafter.

If these ambiguities are left unresolved in the timeframe of the Copenhagen negotiations, we may well end up giving up on strategies that can limit total warming to 2°C. In particular, proposals promising only a post-2020 global emissions peak would dramatically diminish society's ability to gain a 2°C pathway. Indeed, it would condemn us, and our children, to a bitter choice between catastrophic warming on the one hand and, on the other, an extremely disruptive, 11<sup>th</sup>-hour infrastructural and economic transition with near-zero odds of gaining political acceptance and being implemented in time.

## The South's dilemma

A simple thought experiment, illustrated in this figure, illustrates the scope of the political challenge. Here, we show a scientifically realistic assessment of the size of the remaining global carbon budget, defined by a pathway ambitious enough to be considered a true 2°C emergency pathway, shown in red. We also show the portion of that budget that the wealthy Annex I countries would consume even if they undertake bold efforts to virtually eliminate their emissions by 2050 (as shown in 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 before 2015 and decline to 80% below 1990 levels by 2050, such that CO<sub>2</sub> concentrations can peak below 420 ppm and then start to fall very rapidly. Yet even this would hardly mean that we were “safe.” We would still suffer considerable climate impacts and risks, as well as an approximately 15-30% probability of overshooting the 2°C line<sup>ii</sup>. Thus, 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 I emission path shown here is more aggressive than even the most ambitious of current EU and US proposals. It has emissions declining at more than 5% annually from 2012 onwards, and ultimately dropping to a near-zero level. It's a tough prospect, and if it can be considered politically plausible today, it is just barely so.
- And, still, the atmospheric space remaining for the developing world would be extremely constrained. In fact, developing country emissions would have to peak only a few years later than those in the North – still before 2020 – and then decline by more than 5% annually through 2050. And this would have to take place while most of the South's citizens were still struggling out of poverty and desperately seeking a meaningful improvement in their living standards

It is this last point that makes the climate challenge truly 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, consequently, a seemingly inevitable increase in fossil fuel use and thus carbon emissions. From the standpoint of developing countries, this pits development squarely against climate protection. And for this



reason, developing countries have been unambiguous in their insistence that, as important as it is to deal with climate change, a solution cannot come at the expense of their development. And while things don't have to be this way – after all, clean energy alternatives exist – the point is that they exist only as hypothetical alternatives. They are not yet real, not at least for the poor. Moreover, with even the minimal Millennium Development Goals being treated as second-order priorities, with little demonstrated interest in meeting them on the part of the North, the level of international trust is very low indeed.

That this is foremost in the minds of southern negotiators should surprise no one. First, the development crisis has shown itself to be not merely a challenge but an intractable crisis, badly in need of an expansion of resources and political attention. Second, the impacts of climate change, which the wealthy nations are largely responsible for, are beginning to come down hard, and this will only make the crisis more acute. And now, third, the South's negotiators have to face the very real possibility that the imperatives of climate stabilization will deprive their countries of access to the cheap fossil energy sources that helped make the wealthy countries wealthy in the first place. Both China and India, as we all know, are counting on their vast coal reserves to fuel their long-awaited growth.

The situation, to put it gently, invites political impasse.

## 2 The Greenhouse Development Rights framework, in brief

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The Greenhouse Developments Rights approach was designed to highlight the challenges of the extremely stringent emissions reductions pathway that is needed to stabilize the climate, and to demonstrate the sort of principle-based burden sharing system that will be needed before we can seriously commit to such a pathway. It seeks to squarely face, in particular, this fundamental problem: The vast majority of the emission reductions required to “prevent anthropogenic interference with the climate system” must be in the developing world, where most emissions now occur and where emissions are growing most rapidly. At the same time, the development crisis, and beyond it the fundamental aspirations of the developing world, demand a vast expansion of energy services to finally eliminate endemic “energy poverty,” a goal that, in turn, seems inexorably to imply increased carbon emissions.

This is the core of the climate predicament, and the reason why the developing countries insist that, as important as climate stabilization may be, it cannot come at the expense of their development. This, precisely, is the problem that must be solved before any emergency mobilization can possibly begin.

Although the Greenhouse Development Rights approach does not begin with a realpolitik-style assessment of negotiating power, it ultimately charts out an extremely pragmatic approach. Beginning with the structural logic of the climate impasse, it asserts that a “right to sustainable development” is not only ethically justifiable, but also, fundamentally, a non-negotiable foundation of greenhouse-age geopolitical realism. Its key claim is that, unless the climate regime explicitly preserves such a right, developing country negotiators may quite justifiably conclude<sup>iii</sup> that they have more to lose than to gain from any truly earnest engagement with a global climate regime that, after all, significantly curtails access to the energy sources and technologies that historically enabled growth in the industrialized world.

There’s more than this to justice, of course, much more, but the core of the GDRs approach is the simple proposition that the poor must, at a minimum, be excused from the burdens of the climate transition. This simple concept is then built up into a demonstrably robust burden-sharing framework based on responsibility and capacity – the principles at the core of the UNFCCC’s “common but differentiated responsibilities and respective capabilities”. Critically, GDRs defines both responsibility and capacity in terms of a *development threshold* – a level of well-being that is modestly above a global poverty line, a threshold below which individuals are not required to bear the costs of addressing the climate problem, and are instead allowed simply to prioritize development.

In turn, the GDRs approach defines and then quantifies the burdens appropriate to the world’s comparatively wealthy population, those living above this development threshold — both in the developing countries and industrialized countries. It is this minority, after all, that has both the responsibility for the climate crisis and the capacity to solve it. Whether they live in the industrialized or the developing world, they’re the ones who must bear the costs of the transition, not only by curbing the emissions associated with their own consumption, but also by ensuring that, as people in the “underdeveloped world” rise into the global middle class, they are able to do so along sustainable, low-emission paths.

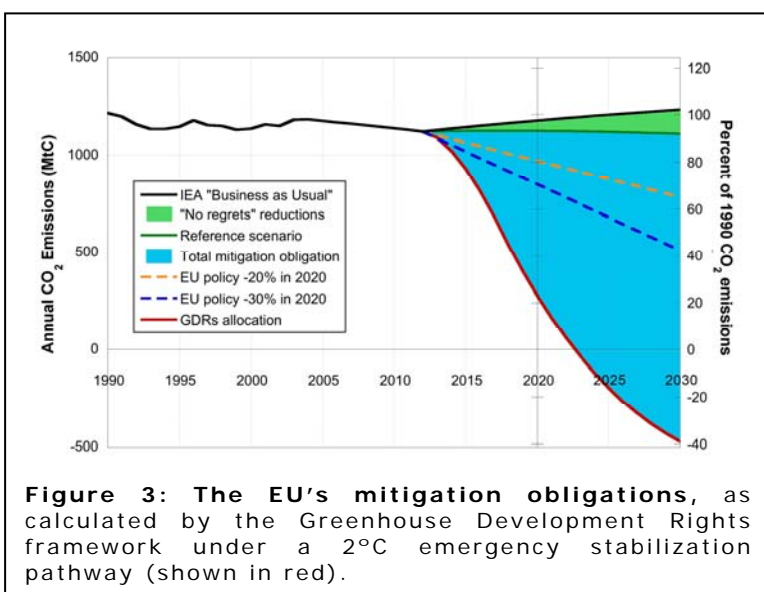
Within the international climate regime, this implies that those of us above the development threshold must bear a strict, legally binding, two-fold obligation. First, we must commit to deep

reductions in our own domestic emissions, and if these seem “unrealistically” stringent, we must realize that it is climate science itself and not the logic of fair burden sharing that requires such stringency. Second, we must support (through finance and technology) a rapid clean energy transition in the developing world, and, of course, the adaptation necessary to minimize, insofar as we still can, greenhouse-related damages and suffering. Such obligations, follow from our outsized historical responsibility and wealth – and, to generalize just a bit, everybody knows it. A great deal will depend of our willingness to recognize that – at the end of the day – fulfilling these obligations is in our own self-interest.

### 3 The EU's proposed commitments vs. its GDRs obligations

The GDRs framework provides a basis for explicitly and transparently quantifying national mitigation obligations for every country, developed or not. And we do so (see the Appendix) for a global emergency emissions reduction pathway that is stringent enough to provide a high probability of holding the 2°C line. By 2020, the EU's share (~23%) of the global total (approximately 3700 MtC) reaches roughly 850 MtC. (Under the GDRs framework, EU would also have an obligation to accept 23% of the global adaptation burden, however large or small it finally turns out to be. With estimates of the global adaptation need in the range of tens of billions to more than one hundred billion annually, the EU's current commitments fall well short of the necessary order of magnitude.)

Figure 3 shows the EU's emissions reduction obligations (the blue wedge), relative to its reference pathway. As is strikingly clear the EU's emission allocation plummets to almost 80% below 1990 levels by 2020, and passes below zero in about 2023.



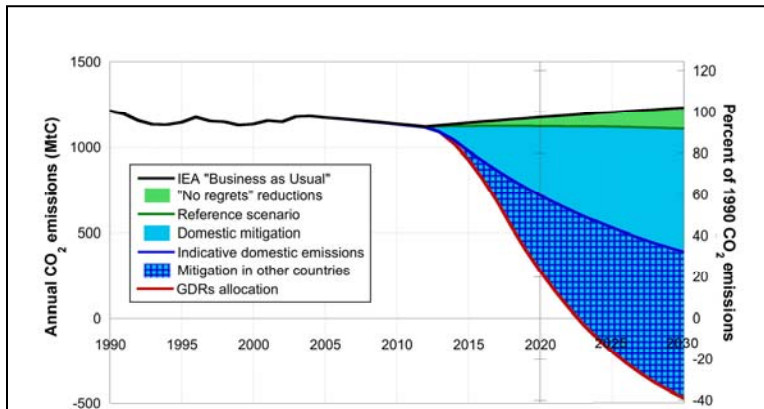
**Figure 3: The EU's mitigation obligations**, as calculated by the Greenhouse Development Rights framework under a 2°C emergency stabilization pathway (shown in red).

As radical as this reduction obligation seems (and it seems radical indeed when compared to the two EU policy scenarios – dashed yellow for a 20% below 1990 by 2020 reduction and dashed blue for a 30% by 1990 by 2020 reduction) it is necessary nonetheless. It is especially so if the EU is to remain consistent with its 2°C objective, and to do so in a manner that is also consistent with preserving a meaningful

global right to development.

Clearly, a reduction target of this magnitude is meaningful only if it is taken to signify a combined obligation to, on the one hand, make reductions domestically and, on the other, invest in international reductions. The implied two-fold obligation, in the context of a 2°C emergency mobilization, is extremely ambitious on both sides, as is shown in Figure 4.

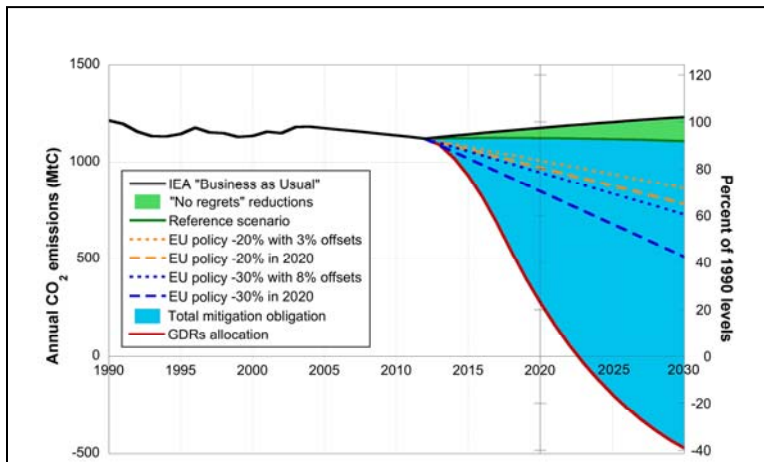
Figure 4 presents an indicative division of this reduction obligation, into a domestic mitigation effort (light blue), and an international mitigation effort (blue, hatched). In this example, the domestic mitigation effort is defined as matching the rapid decline needed to put the EU on course toward a target of 90% reductions relative to 1990 levels by 2050. By 2020, domestic emissions are roughly 40% below 1990 levels. The international obligation, which is over and above this ambitious domestic effort, reflects an additional mitigation effort in 2020 of nearly another 40%, relative to 1990 levels.



**Figure 4: The EU's mitigation obligations**, as calculated by the Greenhouse Development Rights framework under a 2°C emergency stabilization pathway (shown in red). An indicative domestic reduction effort is shown for comparison purposes.

This international effort would be undertaken in countries with mitigation potential in excess of that needed to meet their own domestic mitigation obligations. As with the US, and indeed with all countries or regions with high capacity and responsibility, the EU has a two-fold obligation, to ensure deep domestic reductions and to catalyze rapid reductions in developing countries through financial and technological support.

Figure 5 compares this same GDRs allocation to the reduction targets contained in the European Commission's burden-sharing proposal. The EC proposes a "firm independent commitment to achieve at least a 20% reduction of greenhouse gas emissions by 2020 compared to 1990", and a 30% reduction "provided that other developed countries commit themselves to comparable emission reductions and economically more advanced developing countries commit themselves to contributing adequately according to their responsibilities and capabilities."



**Figure 5: The EU's mitigation obligations**, as calculated by the Greenhouse Development Rights framework, under a 2°C emergency stabilization pathway, compared to the current European Commission reduction proposal.

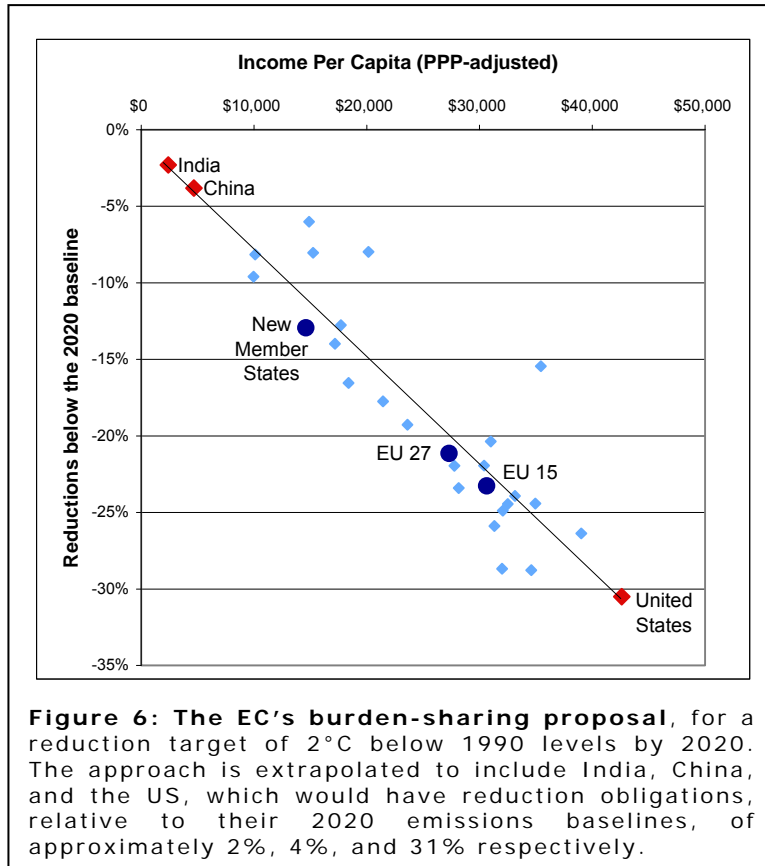
The dashed lines show, for both cases, the portion of the EU commitment that could be offset using international sources (e.g., CDM credits), which amount to about one-third of the required reduction in the 20% case, and two-fifths in the 30% case. Clearly, these targets entail a significant deviation from the EU's baseline emissions, and would require a level of effort that will be hard for the EU, with its consensus decision

making, to decide to support. Just as clearly, however, this level of effort falls far short of the GDRs view of the EU's mitigation obligations.

An effort to strengthen the European Commission's proposed targets was mounted by Member of the European Parliament Satu Hassi, vice-chair of it's Environment Committee. As Rapporteur for the effort-sharing decisions of the Parliament, Hassi proposed amendments to the European Commission proposal that would have, in several respects, brought European climate efforts more closely into line with the expectations of a GDRs allocation. The proposed amendments would have established the 30% reduction requirement as the EU default target (only to be weakened to 20% in the absence of a comprehensive international agreement), and then defined this reduction as a target to be met wholly domestically. In addition to this domestic effort, the proposal required a further international effort amounting to 850 MtCO<sub>2</sub> in 2020, which would have been divided among EU Member States in an equitable way that took their relative per capita GDP into account. The combined effort significantly exceeds the original EC proposal, and while it does not match the ambition of the GDRs approach, it does achieve nearly two-thirds of the GDRs-required reduction, and firmly establishes the principle of a two-fold obligation.

The Environment Committee did not pass Hassi's specific proposal in its original form, but did preserve the notion of a specific international obligation. Europe's investment in international mitigation is to be funded by one quarter of EU ETS auction revenues, which will be allocated to REDD activities, other mitigation activities, and technology transfer. This can be expected to yield roughly one half of the international reductions that Hassi's original proposal called for. (In addition, the Environment Committee has accepted that one quarter of auction revenues, plus an additional 10 billion euros, be allocated to adaptation in developing countries.)

The above figures show the obligation of the EU27, undifferentiated by country or even to the



level of EU 15 vs. new Member States. However, the effort sharing between EU Member States is interesting in its own right, and incidentally sets an important precedent.

The EU's burden-sharing proposal is complex and detailed, in large part because it is designed to explicitly introduce equity into the burden-sharing system through special provisions for Member States with lower per capita incomes. These equity provisions include a reallocation of allowances under the European Emissions Trading System (ETS), and more generous targets for the non-ETS sectors. Figure 6 illustrates their significance.

Each Member State is represented by a light blue diamond, positioned so as to indicate its PPP-adjusted income and its reduction obligation relative to its 2020 baseline (including both ETS and non-ETS sectors).

Figure 6 also shows that the aggregate obligation of the New Member States (13%) is quite a bit less demanding than that of the EU15 (23%) (see the dark blue circles). In fact, New Member State targets actually allow for growth in absolute emissions relative to current levels. This is because the EC burden-sharing proposal is explicitly designed to accommodate the inequality within the EU, where the average income in the EU15 Member States (\$31,000) is more than twice that in the New Member States (\$15,000).

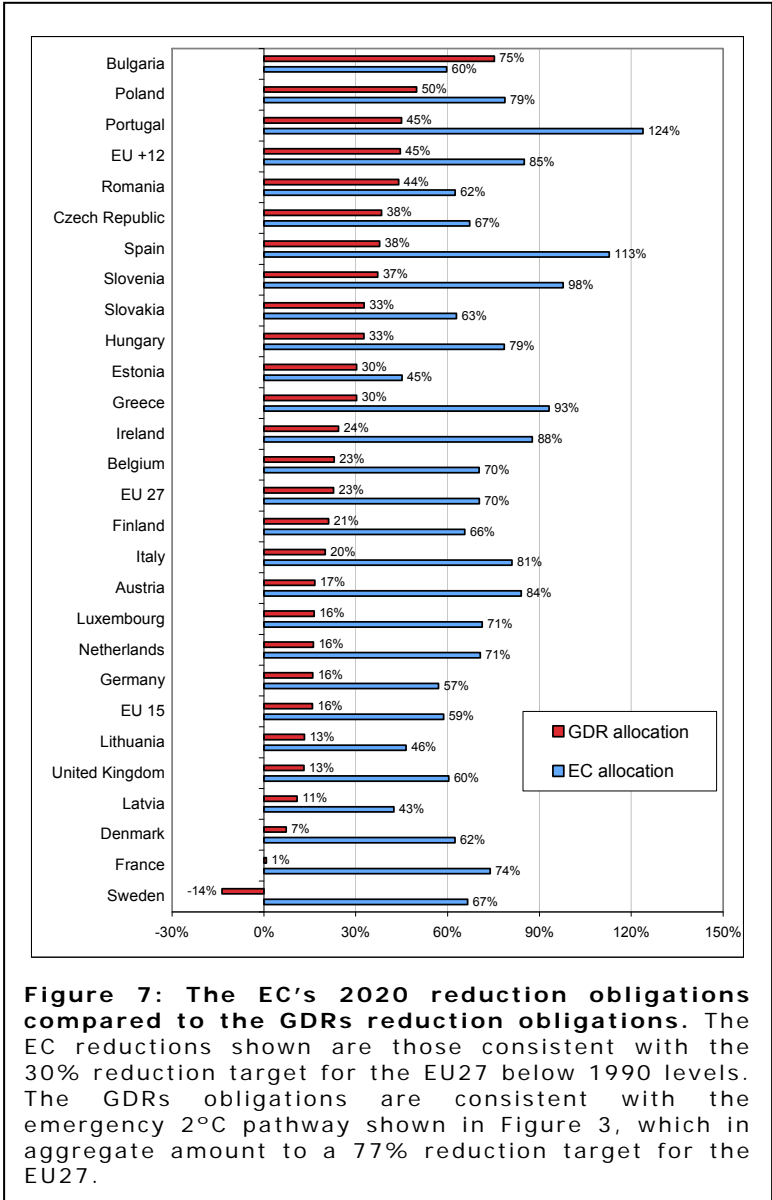
Consider the implications of taking the EU effort sharing approach as a basis for global differentiation. So that, if we assume that the simple linear relationship between PPP-adjusted per-capita income and emissions-reduction obligations that maintains within the EU continues, then India's implied obligation (with its income of less than \$2,400 per capita) would amount to barely a 2% reduction below its 2020 baseline. China (with a per capita income of \$4,700), for its part, would have a target of slightly less than 4%, and the United States' (\$42,600) obligation would be roughly 31%.

The EC burden-sharing framework, unfortunately, is complex and somewhat ad hoc, and even if it worked internationally – even if it demonstrably protected the South's right to development – its lack of transparency would prevent it from being acceptable as a principle-based, global burden-sharing framework. Still, it at least approaches the burden sharing problem in a reasonable way, and for this it deserves our admiration. And there's not much further to go before you have an approach that can be applied to the even more diverse array of countries around the globe.

Such a system, we claim, will look a great deal like Greenhouse Development Rights, a framework that, as explained below, is designed to be as simple as possible while still capturing the intention behind the UNFCCC's famous principles of "common but differentiated responsibilities and respective capabilities." For GDRs, by incorporating responsibility, captures the necessities of the polluter pays principle and establishes incentives for low-carbon development. By incorporating capacity, it respects the obvious truth that climate is an overarching civilizational challenge that will demand major financial resources. By defining both responsibility and capacity with respect to a development threshold, it safeguards a meaningful right to development. And, critically, by accounting for intra-national disparities in wealth, it recognizes that that right to development adheres to individuals, not countries, and that the relatively wealthy in poor countries, like their compatriots in the North, quite properly share the common obligation to stabilize and protect the global climate.

Where the EU burden-sharing proposal is most glaringly lacking is in its overall level of ambition. This is illustrated in Figure 7, below, which compares national allocations under the EU's "30% below" scenario with Greenhouse Development Rights allocations under the 2°C emergency pathway. In both cases the allocation is shown relative to 1990.

In the emergency pathway case, mitigation requirements for all EU Member States are vastly more ambitious. This, it must be stressed, is much more a consequence of the pathway than of the GDRs burden-sharing system itself.



Nevertheless, we have conducted this analysis in the unforgiving terms of the 2°C emergency pathway, for it is exactly the sort of extremely stringent target that the GDRs framework is designed to support. A more forgiving temperature target, like those implied by the EU's 20% and even its 30% aggregate emissions reduction goal, would not yield such daunting numbers. This would be a virtue were it not for one small detail – such targets would also fail to prevent a climate catastrophe.



## 4 The European Union, in the world

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The Greenhouse Development Rights framework doesn't in and of itself specify the portion of any national or regional obligation that should be met domestically. As is clear from the sheer scale of Europe's obligation, however, some significant fraction of it would have to be met internationally. And this is as it should be – the climate problem can not be solved without extensive financial and technological support for a low-carbon transition in the South.

But can this option be abused? Here we should immediately admit the obvious truth, that it clearly can be.<sup>iv</sup> Not that all the many criticisms of “offsets” are unassailable, but many are entirely justified, and two, in particular, demand review. The first is that international offsets are often not backed up by real mitigation. These “non-additional” offsets are environmentally valueless, if not fraudulent. The second is that even entirely genuine, fully additional international offsets can potentially allow wealthy countries to “buy their way out” of the pressures of the climate transition, by pursuing most or even all of their reductions outside their own borders.

The first of these points does not require much comment. Fraudulent and low-quality offsets are not going to stabilize the climate, and if we're at all serious they must be purged from the system as soon as possible. But the second is more challenging. Any rapid climate stabilization program will demand significant structural and socio-cultural adjustments. Might not wealthy northerners be willing to pay quite a premium to avoid the discord associated with such adjustments and preserve their high-carbon lifestyles?

In principle, that answer, again, is yes. But we'd like to first reiterate that the climate problem demands that the industrialized countries invest intensely in mitigation in developing countries. And the “purchase” of additional mitigation potential from developing countries is precisely the sort of measurable, reportable, and verifiable transfers of finance and technology that will be needed to drive such investment, and thus a rapid deviation from baseline emissions growth in the developing world. Investment in mitigation in developing world can no longer be seen merely as an “offset” to mitigation efforts that would otherwise take place domestically. It is critical in and of itself.

Given this, the question is whether the rich could use investment in international mitigation to “buy their way out” of the need to make difficult domestic efforts. Our answer is that this danger is far smaller with the stringent sorts of targets that today's science indicates are necessary than it would be with weak, Kyoto-style targets. Scale makes a difference, and in the context of a true global emergency transition, domestic reductions within wealthy countries, even difficult reductions, would become extremely difficult to pass up as the pressures of stringency increase and mitigation opportunities in the South become as costly as those at home, as they eventually would under any even plausibly adequate target. So, all told, it seems to us that the threat of the “rich buying their way out” is not particularly pressing.

Having said this, though, we would add two provisos.

The first is that the international transfers associated with the climate regime will prove politically toxic if they are of dubious environmental integrity, or if they threaten local livelihoods. Significant evidence of either tendency will delegitimize the regime's financial mechanisms, and, by so doing, threaten their collapse. Towards that end, and as a minimum, we must cease to imagine that high quality international reductions are going to be available on the cheap.

The second is even more difficult. It is that the risk of the North overusing southern mitigation

opportunities is overshadowed by the vastly greater risk that the North will balk altogether. In particular, there is little reason to believe that technological and financial support of *the necessary scale* will be delivered by a regime that sees only the countries that inhabit Annex I (a far from perfect rendering of world's high-responsibility and high-capacity nations) as having quantified commitments, and the rest of the world as a mere source of "offsets" designed to reduce the cost of meeting those commitments.

Indeed, it's extremely difficult to imagine an effort of the necessary scale *until we've escaped the Kyoto annexes and established a global regime that assigns properly differentiated commitments around the world*. Far more likely, we believe, that the well-off citizens of the North, faced with demanding obligations and adjustments, will demand in turn that their Southern counterparts face parallel, "fair share" burdens of their own.

In this context, Greenhouse Development Rights can help, for it provides a coherent, transparent framework for defining, debating, and negotiating what those "fair shares" would be. But valuable though such a framework may be, the real problem is that the South is simply not going to embrace its "fair share" of the burden, at least not as matters stand today.

Hence the need for an impasse-breaking transition strategy. One that, in particular, addresses the deep distrust that pervades the South, a distrust rooted in the North's demonstrated failure to meet its UNFCCC and Kyoto commitments to provide technological and financial support for both mitigation and adaptation in the South. So while, in principle, the South could end the international impasse by heroically offering to meet its "fair share" commitments, provided only that the North did the same, it is unlikely to do so, not while it remains convinced that the North would simply take unfair advantage of such an opening, holding the South to its newly-made commitments while continuing to dodge its own. Which is exactly why a meaningful global regime, one that has a decent chance of mobilizing a real emergency climate response, can only emerge if the North takes a big step first.

What might such a step consist of? There are various possibilities, but all of them have one thing in common – they move beyond the confines of realism-as-usual to at least prefigure a world of properly differentiated commitments; commitments that are principle-based and demonstrably consistent with a right to development.

At one end of the spectrum are incremental but meaningful steps forward.

- One possibility, as suggested above, is represented by the EU's Environment Committee decision that evolved from Satu Hassi's proposed amendments to the European Commission proposal. To be sure, the weakened version that passed the Environment Committee isn't likely to occasion any breakthrough in North / South relations, but it did establish the concept of a two-fold obligation, and a strengthened version could support real confidence in the EU's commitment to meeting its 2°C objective under conditions of fair global differentiation.
- A closely related option, and probably a better one at this point, has surfaced with the broadening debate over the potential and uses of the Norwegian auctioning proposal.<sup>v</sup> It is to auction a significant fraction of allowances (under as strict a target as possible) for all of Annex 1, with the resulting revenues going into a UNFCCC fund to support adaptation and REDD. If Norway were to follow the lead of the European Parliament's Environment Committee, and propose to allocate 50% of auction revenues to action in developing countries, the resulting dedicated international fund might well be large enough to be perceived as an meaningful political overture.

These two options would be especially useful, from the standpoint of trust-building, if done in the

context of a new set of Annex I targets that were set not in the opaque manner of the Kyoto targets, but rather by means of transparent and equitable rules, à la a GDRs-style burden sharing framework.

But at the other end of the spectrum lies the possibility of a much bolder move. A forceful statement of leadership would be made if the EU were to simply and unilaterally commit to carrying its proper share of the global 2°C burden. It could, in doing so, draw upon the GDRs analysis to improve its internal burden sharing proposal, transforming it into a proposal that would be transparent, principle-based, and extendable to a future phase of global participation on a fair basis. And it could challenge the rest of the world – the US in particular but the South as well – to follow its lead.

Other variations on these themes are also possible, and some of them – obviously – are more likely than others, at least in the short term. But the key point is that, were the EU to choose to rise to the climate challenge, it could certainly devise a proposal sufficient to its purposes.

In any case, something new must happen in Copenhagen, and if it fails to do so, then none of us should feign surprise at the despair that will follow. And, given the bitter history that has led to the North / South impasse, this “something new” can only be something in which the North acts, bravely, to establish a new momentum. And whatever happens, it must be understood to define a transitional regime, one in which the wealthy countries – once again and perhaps for the last time – accept the opportunity to prove their commitment to earnest action and just burden sharing. It would have to be followed by openness on the part of the South, and we believe that it would be.

## 5 Final Observations

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### **The EC proposal is admittedly ambitious...**

The European Commission, in tabling its current targets and burden-sharing proposal, has sought to walk a fine line between competing priorities. The proposal represents a clear step beyond Kyoto that must be seen as both meaningful and substantive, especially given that the EU still lacks a negotiating partner in the US. Indeed the EC proposal may even imply commitments beyond what popular opinion (particularly in the new Member States) will bear. By normal standards, it is ambitious indeed.

### **...but it would clearly fail to hold the EU's own 2°C line**

But, reckoned against the uncompromising reality of the climate science, the EC proposal is simply inadequate. In fact, it would lock us into a trajectory in which it becomes progressively more difficult to meet the EU's own 2°C target, and it would do so even as the science indicates, in increasingly uncertain terms, that we should be raising, not lowering, our ambitions.

The EC proposal is especially inadequate in a world where the majority of the population still lives in poverty, and for whom the expansion of energy services is a desperate priority. In particular, there is little in the EC proposal that acknowledges the critical role that Europe must play in ensuring that development globally can happen along a low-GHG path.

### **The situation demands true European Leadership, now**

It is imperative that the demands of the linked climate and development predicament be recognized, soon and particularly in the EU, where bold leadership can make a global difference. Whatever happens during the upcoming US election, there is no path to the necessary Copenhagen breakthrough that does not involve a bit of heroism on the part of the EU. The precise framing of Europe's leadership, obviously, will differ depending on whether John McCain or Barack Obama becomes the American President elect. But even with Obama in office, policy changes in the US will take time, and *changes on the necessary scale are far more likely to occur if the EU has set the stage.*

The next move is Europe's to make. In particular, it is time for the EU to table a serious proposal that achieves two ends. It must clearly signal a level of ambition appropriate to the scale of the climate challenge, and indeed to the EU's own 2°C objective. Just as importantly, it must help to break the North / South negotiating impasse. To that purpose, the EU must take two seemingly contradictory steps. It must accept its proper share of the global burden of meeting the 2°C target. And, at the same time, it must resist the temptation to pressure the South into taking corresponding commitments, which – in the short term at least – it will be quite unable to agree to. Which is to say that the South will sternly resist such pressure unless and until the North has demonstrated a transparent and principle-based burden-sharing scheme that the South can trust, confident that its right to development is not being put at risk. Moreover, the North will need to finally demonstrate its willingness and ability to invest in the substantial financial and technological assistance that, despite the promises of Rio and Kyoto, has not yet been forthcoming.

If the EU were to take such bold steps, it wouldn't be surprising if the result broadly resembled the Greenhouse Development Rights approach. GDRs, after all, is only a straightforward implementation of the UN's official principles of responsibility, capacity, and sustainable development, and it is these underlying principles that are at issue in the negotiations. In any

case, the point is that the EU, by unilaterally committing to carry its proper share of the global burden of meeting the 2°C target, would not only reaffirm its commitment to that target, but also prefigure the principle-based differentiation system that is necessary to support and sustain an emergency emissions reduction program in a profoundly unequal world.

Finally, it must be remembered that the G77, and in particular the G5, have made a number of recent overtures, all of them apparently designed to signal flexibility in the face of the Copenhagen deadline. This is a remarkable development, and one that should be celebrated. For, difficult though the EU's position may be, it is critical that EU negotiators clearly recognize that the positions of the developing countries are appreciably worse. Yet, clearly, they are trying to negotiate.

The question is who they will negotiate with. And the answer, alas, is that it will not be the United States, not yet. The next step will have to be taken with Europe.

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## 6 Appendix: The Greenhouse Development Rights Framework, in detail

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The climate crisis confronts us in the midst of an ongoing development crisis. Given this, for any global climate accord to have even a hope of being politically viable, it must acknowledge and explicitly preserve a right to development. The bottom line in this very complicated tale is that the South is neither willing nor able to prioritize emissions reductions above the development of its people. And that, therefore, the key to climate protection is the establishment of a global burden-sharing regime in which it is not required to do so.

The *Greenhouse Development Rights* framework 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 concretely interpreting the official principles of the UN's *Framework Convention on Climate Change*, according to which Parties 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. People below this threshold have development as their proper priority. As they struggle for better lives, they are not obligated to expend their limited resources to keep society as a whole within its sharply limited global carbon budget. They have, in any case, little responsibility for the climate problem and little capacity to invest in solving it.

People with incomes that exceed 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, assume a steadily rising share 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 toward and then cross it, they are able to do so along sustainable, low-emission paths. These obligations, critically, are taken to belong to *all* people with incomes above the development threshold, whether they live in the North or in the South.

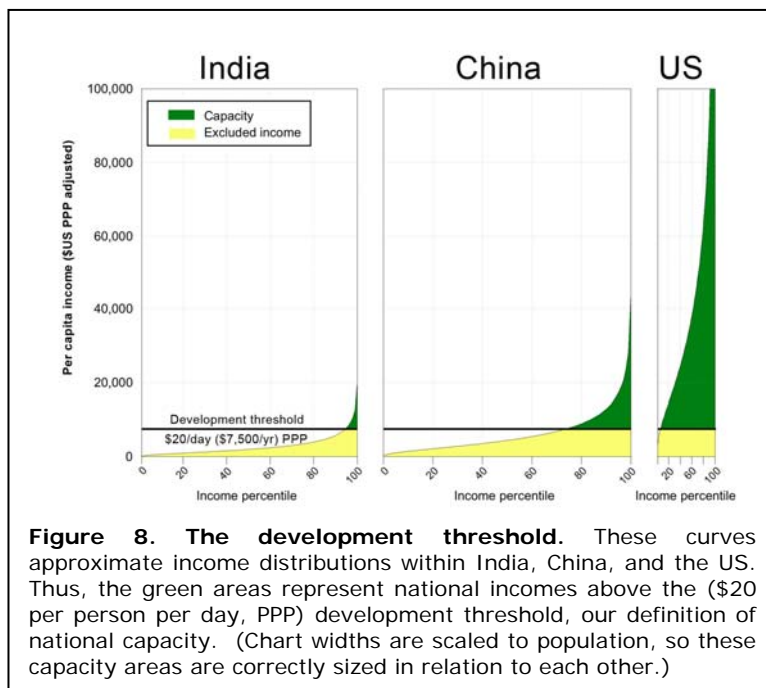
The level where a development threshold would best be set is clearly a matter for debate, one that we would welcome. It is, however, emphatically not an “extreme poverty” line, which is typically defined to be so low (\$1 or \$2 a day) as to be more properly called a “destitution line.” For a development threshold to reasonably capture the principle of a right to development, it should be set at least modestly higher than a global poverty line that reflects a level of welfare that is beyond basic needs, though well short of today's levels of “affluent” consumption.

For the purposes of our indicative quantification here, we draw upon recent empirical analyses of the individual income levels and their correlation with indicators of poverty. As it turns out, it is at an income of approximately \$16 per day (PPP adjusted) that 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. Taking a figure 25% above this global poverty line, we illustrate the implications of the Greenhouse Development Rights approach based on calculations relative to a development threshold of \$20 per person per day (\$7,500 per person per year). Not coincidentally, this income correlates well with the level at which the southern “middle class” begins to emerge.

Once a development threshold has been defined, logical and usefully precise definitions of *capacity* and *responsibility* naturally follow, and these can be built upon to specify and calculate

national obligations for shouldering the climate challenge. Capacity, which we take to mean income that is not demanded by the basic necessities of everyday life, is income that is hypothetically available to be “taxed” for investment in a global emergency climate program *without compromising a fundamental level of welfare*. Honoring a right to development thus means that an individual’s capacity must be defined not as *all* of his or her income, but as their income *excluding income below the development threshold*. And, in turn, a nation’s aggregate capacity 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 some agreed starting year) 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 development 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.

These measures of capacity and responsibility can 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.

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 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 is still less than that of the much smaller but much richer country of Japan (7.8%). 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.

GDRs results for representative countries and groups							
	2010					2020	2030
	Population	GDP	Capacity	Responsibility	RCI	RCI	RCI
<b>EU 27</b>	7.3	30,472	<b>28.8</b>	<b>22.6</b>	<b>25.7</b>	<b>22.9</b>	<b>19.6</b>
<b>EU 15</b>	5.8	33,754	<b>26.1</b>	<b>19.8</b>	<b>22.9</b>	<b>19.9</b>	<b>16.7</b>
EU +12	1.49	17,708	<b>2.7</b>	<b>2.8</b>	<b>2.7</b>	<b>3.0</b>	<b>3.0</b>
<b>United states</b>	4.5	45,640	<b>29.7</b>	<b>36.4</b>	<b>33.1</b>	<b>29.1</b>	<b>25.5</b>
Japan	1.9	33,422	<b>8.3</b>	<b>7.3</b>	<b>7.8</b>	<b>6.6</b>	<b>5.5</b>
<b>Russia</b>	2.0	15,031	<b>2.7</b>	<b>4.9</b>	<b>3.8</b>	<b>4.3</b>	<b>4.6</b>
<b>China</b>	19.7	5,899	<b>5.8</b>	<b>5.2</b>	<b>5.5</b>	<b>10.4</b>	<b>15.2</b>
<b>India</b>	17.2	2,818	<b>0.7</b>	<b>0.3</b>	<b>0.5</b>	<b>1.2</b>	<b>2.3</b>
<b>Brazil</b>	2.9	9,442	<b>2.3</b>	<b>1.1</b>	<b>1.7</b>	<b>1.7</b>	<b>1.7</b>
<b>South Africa</b>	0.7	10,117	<b>0.6</b>	<b>1.3</b>	<b>1.0</b>	<b>1.1</b>	<b>1.2</b>
<b>Mexico</b>	1.6	12,408	<b>1.8</b>	<b>1.4</b>	<b>1.6</b>	<b>1.5</b>	<b>1.5</b>
<b>LDCs</b>	11.7	1,274	<b>0.1</b>	<b>0.0</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
<b>Annex I</b>	18.7	30,924	<b>76</b>	<b>78</b>	<b>77</b>	<b>69</b>	<b>61</b>
<b>Non-Annex I</b>	81.3	5,096	<b>24</b>	<b>22</b>	<b>23</b>	<b>31</b>	<b>39</b>
<b>High Income</b>	15.5	36,488	<b>77</b>	<b>78</b>	<b>77</b>	<b>69</b>	<b>61</b>
<b>Middle Income</b>	63.3	6,226	<b>23</b>	<b>22</b>	<b>22</b>	<b>30</b>	<b>38</b>
<b>Low Income</b>	21.2	1,599	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.3</b>	<b>0.5</b>
<b>World</b>	100 %	9,929	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>	<b>100 %</b>

**Table 1. Percentage shares of total global population, GDP, capacity, responsibility, and RCI for selected countries and groups of countries,** based on projected emissions and income for 2010, 2020, and 2030. (High, Middle and Low Income Country categories are based on World Bank definitions. Projections based on International Energy Agency *World Energy Outlook 2007*.)

As Table 1 shows, the global balance of obligation changes over time, as differing rates of national growth change the global income structure. The results are most evident in the projected change in China's share of the total RCI, which nearly triples (from 5.5% to 15.2%), reflecting China's rapid economic growth and the large number of its citizens whose incomes are projected to rise above the development threshold in the coming two decades.



These figures, again, illustrate the application of the GDRs framework by way of an particular choice of key parameters. Note that for this indicative calculation, the RCI is defined such that all income (and all emissions) above the development threshold count equally. This amounts to a “flat tax” on capacity and responsibility. However, it might well be more consistent with widely shared notions of fairness if the RCI were defined in a more progressive manner. Which is to say that a strong case can be made for a capacity calculation in which an individual’s millionth dollar of income contributed far more to their RCI than his or her ten-thousandth dollar of income. A more progressive formulation of RCI would even be more consistent with the “tax schedules” by which the income tax codes of most countries are structured. It would also, naturally, 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, could potentially reframe the entire debate. 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 I / Non-Annex I 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 I” 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, each a stylized version of the more complex mechanisms that would emerge in real negotiations. The first is a single grand international fund through which all mitigation and adaptation would be financed – such as, say, a greatly expanded version of the Multinational Climate Change Fund proposed by Mexico. Here, the RCI could serve as the basis for determining each nation’s obligatory financial contribution to the fund. So, for instance, if in 2020 the annual funding requirement amounted to one trillion dollars (about 1% of the projected Gross World Product, which is well within the range of published estimates of the cost of a global climate transition), the US, with 29.1% of the global RCI, would be obligated to pay about \$291 billion. Similarly, the EU’s share would be about \$228 billion (22.8% of the global RCI). China’s share would be \$104 billion (10.4%), India’s about \$12 billion (1.2%), and so on, as shown in Table 2, below. The RCI, in effect, would serve as the basis of a progressive global “climate tax” – not a carbon tax, per se, but a responsibility and capacity tax.

	National Income (Billion \$ )	National Capacity (Billion \$)	National Capacity % GDP	National Obligation (Billion \$)	National Obligation % GDP
<b>EU 27</b>	\$19,327	\$15,563	80.5%	\$ 216	1.12%
<b>EU 15</b>	\$16,752	\$13,723	81.9%	\$ 188	1.12%
<b>EU +12</b>	\$ 2,574	\$ 1,840	71.5%	\$ 28	1.09%
<b>United States</b>	\$18,177	\$15,661	86.2%	\$ 275	1.51%
<b>Japan</b>	\$ 5,071	\$ 4,139	81.6%	\$ 62	1.23%
<b>Russia</b>	\$ 2,905	\$ 1,927	66.3%	\$ 41	1.40%
<b>China</b>	\$13,439	\$ 5,932	44.1%	\$ 98	0.73%
<b>India</b>	\$ 5,814	\$ 972	16.7%	\$ 11	0.19%
<b>Brazil</b>	\$ 2,535	\$ 1,376	54.3%	\$ 16	0.64%
<b>South Africa</b>	\$ 706	\$ 422	59.8%	\$ 10	1.42%
<b>Mexico</b>	\$ 1,744	\$ 1,009	57.9%	\$ 15	0.84%
<b>LDCs</b>	\$ 1,549	\$ 82	5.3%	\$ 1	0.06%
<b>Annex I</b>	\$50,368	\$40,722	80.8%	\$ 652	1.29%
<b>Non-Annex I</b>	\$44,037	\$18,667	42.4%	\$ 292	0.66%
<b>High Income</b>	\$49,279	\$40,993	83.2%	\$ 655	1.33%
<b>Middle Income</b>	\$41,546	\$18,190	43.8%	\$ 286	0.69%
<b>Low Income</b>	\$ 3,579	\$ 206	5.8%	\$ 3	0.08%
<b>World</b>	\$94,405	\$59,388	62.9%	\$ 944	1.00%

**Table 2. GDP, capacity, and obligation, projected to 2020.** These figures assume that the total cost of the global climate program is 1% of GWP, or about \$1 trillion in 2020.

These figures (their values for key countries and regions are given in Table 2) are, again, based on the assumption of a total annual global cost, for both mitigation and adaptation, of one trillion dollars a year. If it turned out that these costs were instead, say, two trillion dollars (about 2% of projected 2020 GWP), national obligations would come to twice the figures shown.

We can make the scale of these obligations – and their equity implications – more tangible by considering them in terms of an implied average annual “tax,” for individuals at various levels of income in the year 2020. In Table 3, for three levels of total global cost (0.5%, 1%, and 2% of GWP), we express the GDRs allocation in terms of tax rates, as they would be seen by individuals with annual incomes ranging from \$7500 to \$120,000. Critically, in calculating these bills, we assume that national obligations are passed down to taxpayers according to their individual RCIs, *thus ensuring that burden sharing within nations exactly parallels burden sharing among nations.*

Under such circumstances, individuals below the development threshold, who contribute nothing to their nation’s obligation, would similarly pay nothing toward fulfilling that obligation. In effect, their “climate tax” would be zero. Which is to say that, in 2020, the roughly two-thirds of the world’s population that falls below the development threshold (assuming that intranational income distributions remain as they are today, though of course they will change) would be exempt from paying any climate tax, enabling them to prioritizing the attainment of a basic level of welfare. The remaining population (the top third of the global population), which is projected to control 85% of the world’s income in 2020, would cover the global mitigation and adaptation costs.

Country	income	Total costs: 0.5% of GWP			Total costs: 1.0% of GWP			Total costs: 2.0% of GWP		
		marginal tax rate	average tax rate	annual tax	marginal tax rate	average tax rate	annual tax	marginal tax rate	average tax rate	annual tax
US	\$7,500	0.00%	0.00%	\$0	0.00%	0.00%	\$0	0.00%	0.00%	\$0
US	\$15,000	1.75%	0.44%	\$66	1.75%	0.88%	\$132	1.75%	1.75%	\$263
US	\$30,000	1.75%	0.66%	\$198	1.75%	1.32%	\$396	1.75%	2.64%	\$792
US	\$60,000	1.75%	0.77%	\$462	1.75%	1.54%	\$924	1.75%	3.08%	\$1,848
US	\$120,000	1.75%	0.83%	\$990	1.75%	1.65%	\$1,980	1.75%	3.30%	\$3,960
Sweden	\$7,500	0.00%	0.00%	\$0	0.00%	0.00%	\$0	0.00%	0.00%	\$0
Sweden	\$15,000	0.79%	0.20%	\$30	0.79%	0.39%	\$59	0.79%	0.79%	\$118
Sweden	\$30,000	0.79%	0.30%	\$89	0.79%	0.59%	\$177	0.79%	1.18%	\$354
Sweden	\$60,000	0.79%	0.35%	\$207	0.79%	0.69%	\$414	0.79%	1.38%	\$828
Sweden	\$120,000	0.79%	0.37%	\$444	0.79%	0.74%	\$888	0.79%	1.48%	\$1,776
World Avg	\$7,500	0.00%	0.00%	\$0	0.00%	0.00%	\$0	0.00%	0.00%	\$0
World Avg	\$15,000	1.38%	0.34%	\$52	1.38%	0.69%	\$103	1.38%	1.38%	\$206
World Avg	\$30,000	1.38%	0.52%	\$155	1.38%	1.03%	\$309	1.38%	2.06%	\$618
World Avg	\$60,000	1.38%	0.60%	\$360	1.38%	1.20%	\$720	1.38%	2.40%	\$1,440
World Avg	\$120,000	1.38%	0.75%	\$894	1.38%	1.49%	\$1,788	1.38%	2.98%	\$1,788

**Table 3. "Climate tax" for various income levels.** The marginal tax rate, average tax rate, and total annual bill are shown, under three different assumptions about the total costs of the emergency climate mitigation and adaptation costs (0.5%, 1.0%, and 2.0% of Gross World Product).

We show three representative cases: a country with high responsibility relative to its capacity (the US), a country with low responsibility relative to its capacity (Sweden), and world average responsibility. Note that, although each incremental dollar of income or ton of emissions is taxed at the same rate (as in a "flat tax"), income and emissions below the development threshold are explicitly excluded, and therefore the whole system is modestly progressive. Note too that when you compare individuals with the same level of income, across countries with different levels of responsibility, their overall "tax" is not the same. The tax for individuals at the same income level varies (being highest for the US and lowest for Sweden), reflecting the fact that this is a capacity- and responsibility-based *climate tax*, not simply an income tax, nor a carbon tax.

This analysis, we claim, has two clear implications, that fair burden sharing is of great pragmatic significance, and, by definition, any fair burden sharing system must take intra-national income distribution into proper account. Even if the costs of a rapid climate transition are assumed to be quite high (even higher than the case of 2% of GWP shown in the above table), and *even* if these costs are deemed to be solely the obligation of the minority of people with incomes above a \$7,500/year development threshold (less than one third of the global population today) they would still be quite bearable. The rich and the relatively well-off can afford to shield the poor from the costs of combating climate change. They can, in other words, afford to honor a meaningful right to development.

## The GDRs framework and national reduction targets

Another perspective on burden sharing, one that is central to the ongoing negotiations, expresses post-2012 obligations in terms of emission reduction obligations and Kyoto-style national targets. We start by comparing a global “business-as-usual” trajectory to the rapidly dropping 2°C emergency pathway, a comparison that allows us to straight-forwardly calculate the total amount of mitigation needed globally in any given year.

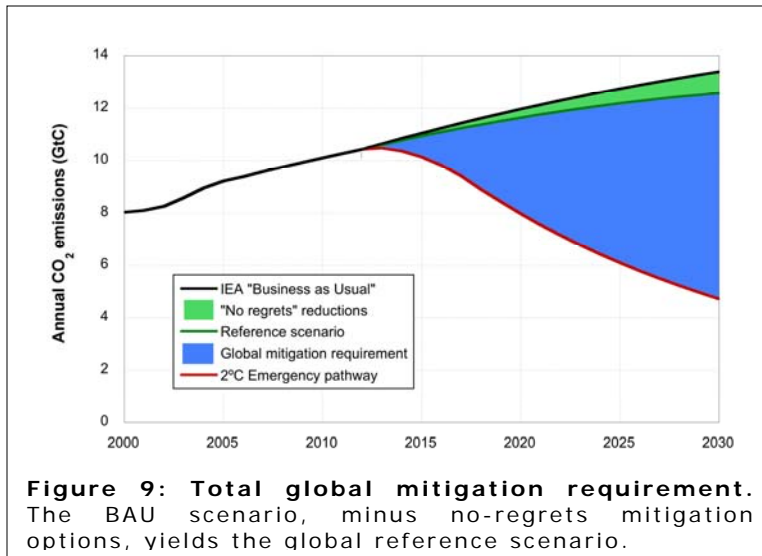
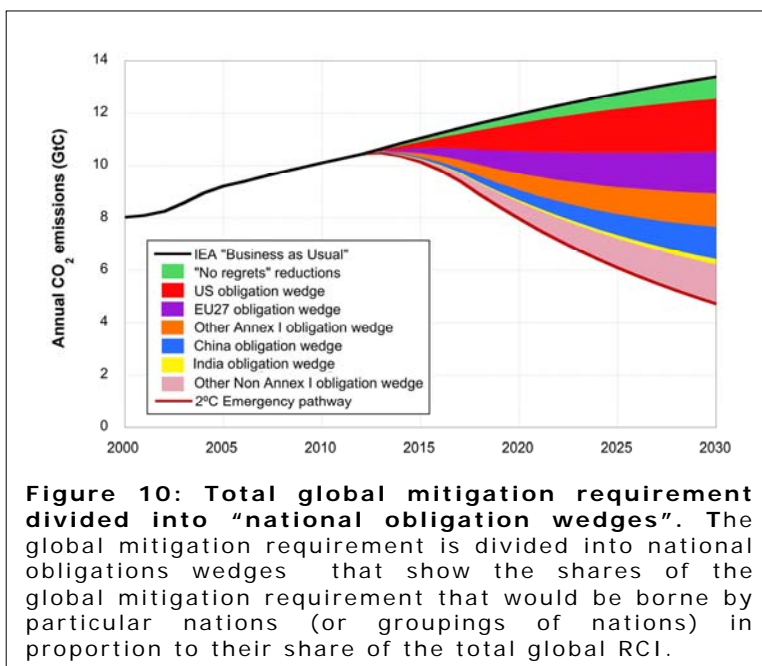


Figure 9 shows this rapidly growing gap divided between (green) “no regrets” reductions, which have zero or net negative costs, and the much larger “global mitigation requirement” (blue).<sup>1</sup> As shown, the calculated global mitigation requirement, excluding the no-regrets opportunities, grows to approximately 3.7 GtC in 2020.

Applying the GDRs framework, national emission reduction obligations are defined as shares of the global mitigation requirement, which is allocated among countries in proportion to their RCI. This is illustrated in Figure 10, which shows this allocation into national obligations with, to give a few prominent examples, the US’s share (29.1%) of the total mitigation requirement appearing as the large red wedge, the EU’s share (22.8%) as the large purple wedge, and China’s share (10.4%) appearing as the smaller but still significant blue wedge.

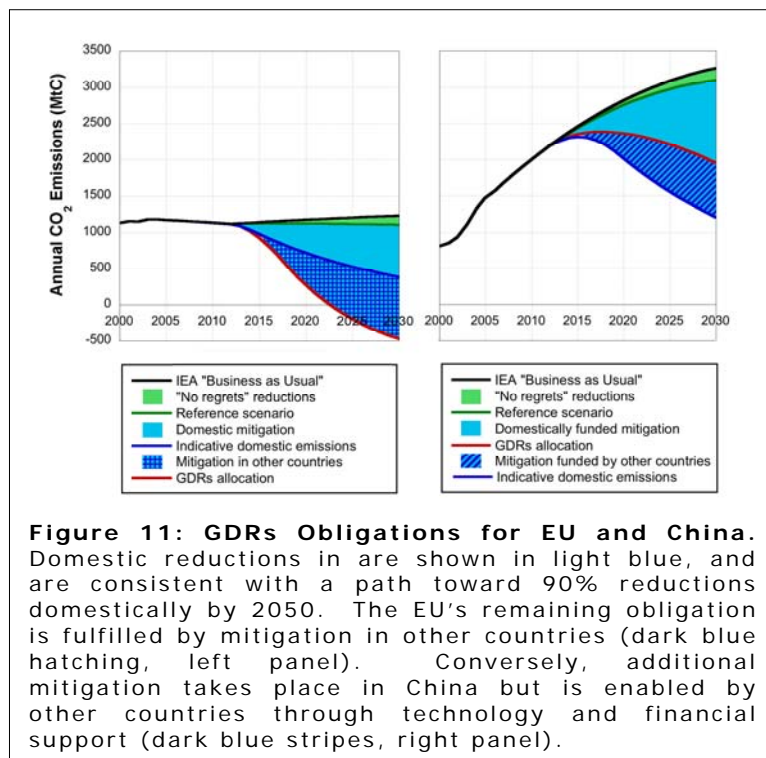


Thus, for example, the EU’s mitigation obligation is (22.8% of the 3.7 GtC global mitigation requirement in 2020) is about 850 GtC.

If this reduction obligation were interpreted literally and achieved entirely through domestic mitigation, it would imply reductions of nearly 140% below 1990 levels – and an EU emission level of

<sup>1</sup> The business-as-usual scenario in this analysis is taken from the International Energy Agency (IEA, 2007); the size of the no-regrets reductions potential is derived from McKinsey Company analysis (Enkvist et al., 2007), and the emergency pathway is the same as that which was presented far above in Figure 3.

minus 500 MtC – by 2030. Obviously, for a mitigation obligation of this magnitude to make sense, the EU must not be expected to meet its entire obligation through domestic reductions. Whatever is not accomplished domestically, the EU would need to fulfill internationally, by way of



reductions in other countries that are “supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner.”<sup>vi</sup>

Figure 11 shows the total EU reduction obligation with an indicative division into a domestic mitigation effort (light blue) and an international mitigation effort (dark blue hatched). The domestic mitigation effort is defined so as to match the rapid decline needed to put the EU on course toward 90% reductions relative to 1990 levels by 2050, consistent with the emission trajectory for Annex I countries

presented in Figure 3 above. It achieves physical domestic reductions by 2030 of more than 60% below 1990 levels. Even this ambitious rate of reductions satisfies well less than half of the EU’s total obligation. The remainder must be made in other countries, and amounts to nearly 900 MtC of reductions in 2030. This means, above and beyond its domestic reductions of more than 60%, the EU is obligated to make additional reductions internationally that amount to more than 70% of 1990 EU emissions.

This very demanding GDRs allocation for the EU is by no means an anomaly or methodological quirk, but rather a direct outcome of the principles underlying the framework. Like any country with high capacity and responsibility, the EU is assigned a very large obligation – large enough to necessitate extremely ambitious reductions both domestically and internationally.

China, in contrast, is obligated to reductions of about 1100 MtC in 2030 (light blue shading), all of which could be made domestically. At the same time, another substantial quantity of reductions within China, about 750 MtC in 2030 using our estimate, (blue striped shading), would be enabled and supported by other countries, those with higher capacity and responsibility.

The examples of the EU and China illustrate a robust and striking conclusion. The national mitigation obligations of the countries with high capacity and responsibility greatly exceed the reductions they could conceivably make at home. In fact, their mitigation obligations will typically come to exceed even their total domestic emissions. Which is to say that, under a GDRs burden sharing framework, countries with high capacity and responsibility ultimately receive “negative allocations”<sup>vii</sup>.

Obligations of this scale may seem simply implausible by today’s standards of political realism, even for countries with high capacity and responsibility. Nevertheless, they are, in the final

analysis, quite unavoidable. It is only through explicit obligations of this magnitude that a climate regime can effectively bring about its two essential outcomes. First, by driving ambitious domestic reductions, these obligations ensure that the wealthier countries free up sufficient environmental space for the poorer countries to develop. Second, by driving equally ambitious international reductions, enabled by technological and financial support from the wealthier countries, they ensure this development occurs along a decarbonized path.

These examples thus show, 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 situation reflects the actual 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, in addition, enable large emissions reductions in countries that lack the capacity (and responsibility) to reduce emissions as much as an emergency 2°C mitigation pathway requires, without significant assistance from others.

It is only by accepting their *two-fold obligation* that the wealthy countries can enable a climate regime that is genuinely consistent with the right to development.

## 7 Appendix: EU and selected country details

	income	population above dev't threshold	capacity	responsibility share	capacity share	RCI share	national obligation to pay	Average obligation to pay	reference emissions	GDR allocation
Country	\$PPP per capita	% of national population	% of GDP	% of global total	% of global total	% of global total	% of GDP	\$ per person above dev't threshold	% relative to 1990	% relative to 1990
<b>EU 15</b>	41,424	99	82	16.70	23.11	19.91	1.12	468	96	16
<b>EU +12</b>	25,981	95	71	2.85	3.10	2.97	1.09	300	82	45
<b>Austria</b>	46,728	100	84	0.36	0.56	0.46	1.10	514	118	17
<b>Belgium</b>	43,689	100	83	0.61	0.66	0.64	1.27	556	95	23
<b>Bulgaria</b>	23,601	96	68	0.18	0.19	0.18	1.05	259	104	75
<b>Cyprus</b>	37,089	100	80	0.04	0.04	0.04	1.21	450	214	99
<b>Czech Republic</b>	36,386	100	79	0.57	0.49	0.53	1.36	495	82	38
<b>Denmark</b>	46,639	100	84	0.28	0.37	0.32	1.18	549	88	7
<b>Estonia</b>	31,107	98	76	0.07	0.05	0.06	1.44	459	52	30
<b>Finland</b>	41,757	100	82	0.28	0.31	0.30	1.24	518	93	21
<b>France</b>	40,850	100	82	1.97	3.64	2.80	1.00	409	97	1
<b>Germany</b>	44,082	100	83	4.43	4.99	4.71	1.25	551	78	16
<b>Greece</b>	40,870	99	82	0.49	0.63	0.56	1.15	471	121	30
<b>Hungary</b>	31,625	100	76	0.24	0.39	0.31	0.97	309	91	33

	income	population above dev't threshold	capacity	responsibility share	capacity share	RCI share	national obligation to pay	Average obligation to pay	reference emissions	GDR allocation
Country	\$PPP per capita	% of national population	% of GDP	% of global total	% of global total	% of global total	% of GDP	\$ per person above dev't threshold	% relative to 1990	% relative to 1990
Ireland	43,799	100	83	0.21	0.31	0.26	1.11	486	134	24
Italy	39,361	99	81	2.26	3.15	2.70	1.10	438	105	20
Latvia	25,313	93	71	0.02	0.06	0.04	0.78	212	43	11
Lithuania	26,869	95	72	0.05	0.10	0.08	0.86	246	43	13
Luxembourg	84,236	100	91	0.06	0.07	0.07	1.38	1160	91	16
Malta	34,312	99	78	0.01	0.02	0.02	1.05	364	152	59
Netherlands	47,798	100	84	0.87	1.14	1.00	1.18	566	102	16
Poland	24,796	93	70	1.17	1.09	1.13	1.16	309	89	50
Portugal	27,672	91	74	0.26	0.37	0.32	1.00	305	144	45
Romania	17,864	90	59	0.27	0.36	0.32	0.83	165	69	44
Slovakia	28,286	100	74	0.15	0.19	0.17	1.05	300	71	33
Slovenia	41,273	100	82	0.07	0.11	0.09	1.07	441	122	37
Spain	35,781	99	79	1.49	2.23	1.86	1.05	378	148	38
Sweden	42,517	100	82	0.26	0.57	0.41	0.95	404	86	-14
United Kingdom	41,899	99	82	2.71	3.71	3.21	1.13	476	87	13



	income	population above dev't threshold	capacity	responsibility share	capacity share	RCI share	national obligation to pay	Average obligation to pay	reference emissions	GDR allocation
Country	\$PPP per capita	% of national population	% of GDP	% of global total	% of global total	% of global total	% of GDP	\$ per person above dev't threshold	% relative to 1990	% relative to 1990
United States	53,671	96	86	31.85	26.37	29.11	1.51	841	119	41
Japan	40,771	100	82	6.24	6.97	6.61	1.23	504	104	26
Russia	22,052	95	66	5.38	3.24	4.31	1.40	326	77	53
China	9,468	41	44	10.74	9.99	10.36	0.73	169	443	381
India	4,374	14	17	0.72	1.64	1.18	0.19	58	391	363
South Africa	14,010	51	60	1.42	0.71	1.07	1.42	395	188	139
Brazil	11,519	44	54	1.15	2.32	1.73	0.64	170	227	120
Mexico	14,642	59	58	1.39	1.70	1.54	0.84	207	169	99
LDCs	1,567	2	5	0.05	0.14	0.10	0.06	58	310	294
Annex I	38,425	94	81	69.49	68.57	69.03	1.29	529	101	38
Non-Annex I	6,998	26	42	30.51	31.43	30.97	0.66	180	319	258
High Income	44,365	98	83	69.74	69.02	69.38	1.33	602	126	45
Upper Middle	17,438	73	62	14.12	11.74	12.93	1.08	256	116	79
Lower Middle	7,419	30	37	15.93	18.89	17.41	0.54	132	325	277
Low Income	2,022	3	6	0.22	0.35	0.28	0.08	51	189	182
World	12,415	38	63	100 %	100 %	100%	1 %	330	170	108

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<sup>i</sup> For more on this point, see the IPCC’s AR4 and updates to the science found, for example, in David Spratt & Philip Sutton, *Climate Code Red: the Case for Emergency Action*, especially chapter 5, “The Quickening Pace.” (Scribe Publications, Melbourne, 2008). See [www.climatecoded.net](http://www.climatecoded.net).

<sup>ii</sup> For details, see Baer and Mastrandrea (2006) and Meinshausen (2006).

<sup>iii</sup> The statement issued by the “G5 countries” (Brazil, Mexico, India, South Africa and China) after 2008’s G8 meeting in Japan is particularly notable, for it contains this: “Negotiations for a shared vision on long-term cooperative action at the UNFCCC, including a long-term global goal for greenhouse gases (GHG) emissions reductions, must be based on **an equitable burden sharing paradigm that ensures equal sustainable development potential for all citizens of the world and that takes into account historical responsibility and respective capabilities as a fair and just approach**. It is essential that developed countries take the lead in achieving ambitious and absolute greenhouse gas emissions reductions in accordance with their quantified emission targets under the Kyoto Protocol after 2012, of at least 25-40 per

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cent range for emissions reductions below 1990 levels by 2020, and, by 2050, by between 80 and 95 per cent below those levels, with comparability of efforts among them.” (Emphasis added. See <http://www.twinside.org.sg/title2/climate/info.service/climate.change.20080702.htm>).

<sup>iv</sup> For a recent roundup of the bad news here, see Patrick McCully, "The Great Offset Swindle: How Carbon Credits are Gutting the Kyoto Protocol, and Why they Must be Scrapped," in *Bad Deal for the Planet: Why Carbon Offsets Aren't Working... and How to Create a Fair Global Climate Accord*. [www.internationalrivers.org/files/DRP2English2008-521\\_0.pdf](http://www.internationalrivers.org/files/DRP2English2008-521_0.pdf)

<sup>v</sup> The Norwegian proposal has, at this point, been released in only a very preliminary form – see the slides at [http://unfccc.int/files/meetings/ad\\_hoc\\_working\\_groups/lca/application/pdf/norway.pdf](http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/norway.pdf) – as a proposal auctioning a small fraction of Annex 1 allowances to support adaptation. But it's likely that Norway will develop it further in the months ahead, and in any case the potential of such approaches is obvious.

<sup>vi</sup> The Bali Action Plan, Decision 1/CP.13 para 1(b) ii.

<sup>vii</sup> 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.