



what next

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Climate, Development and Equity

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Foreword

I am writing this from within a few hundred miles of the North Pole, on board a Greenpeace research ship. We are heading due north in what should, at this time of year, be thick, old, impassable pack ice but is actually thin one- and two-year old ice floes that our small boat easily rides over or navigates through. The sea ice has retreated far further than ever before and the 2012 sea ice melting season is still not over.

With me are leading sea-ice scientists from the US national snow and ice data centre in Colorado and Cambridge University in Britain. By nature they are conservative, but now they are surprised, even shocked. They knew the Arctic ice was getting thinner and that the area which it usually covers in summer months has been getting smaller since the 1970s. But what they have witnessed this year in the Arctic is extraordinary and unprecedented. No scientist expected this speed of melt. The weather conditions have not been particularly conducive for this record retreat, nor have there been unusual storms. Something else is happening, they say, and it can only be the observed warming in the Arctic. One of the scientists aboard has calculated man's contribution to the Arctic meltdown as over 60 per cent.

The world is now in uncharted waters and there is no way we can tell how climate change will affect places and people in the next few years. It is happening far faster and much deeper than the models ever expected. The questions pile up but there are no definite answers: will there be a largely ice-free Arctic in the summer months within 10-20 years? Almost certainly; perhaps far sooner, say some. Will the jet stream that largely influences the weather in the northern hemisphere be affected, bringing more of the extremes the US, Russia and Europe have recently seen? Probably. Will the process of climate change accelerate? Certainly. What will this mean to the developing countries of Africa or Asia, to the low-lying Pacific islands, the world's great coastal cities like Lagos and Chittagong, the plains and the foodbaskets, the deserts and oceans?

For the melting Arctic, read more frequent, more severe droughts in sub-Saharan Africa and the Andes, fiercer cyclones in Bangladesh and stronger heatwaves in Europe. We don't know the details or the timing but we can expect the poorest countries, the indigenous peoples and the most vulnerable communities to be the most affected.

The injustice of climate change is terrifying. As this urgent, much-needed volume makes clear, the rich, who have largely caused this terrifying situation with their historical emissions, are still refusing or delaying action. These contributions from some of the world's most far-sighted commentators should be required reading for heads of state, policymakers, journalists, activists and the concerned public. Together they make the loudest call for political and individual action and give governments the legitimacy to act. But we must beware the false solutions that reinforce the systems which have resulted in climate change and the food and energy crises.

There is still time to avoid the worst of climate change and to address the inequalities which have caused it.

But we can no longer delay.

John Vidal,
Environment Editor, *The Guardian*,
aboard the *Arctic Sunrise*



CLIMATE
JUSTICE

Acknowledgements

Many people have helped in the making of this volume.

First and foremost are the authors, whose dedication, brilliance and insights have made this collection of articles possible. Some of you I have known for many years, while others are newer acquaintances. I look forward to continued collaboration for many years to come. Thanks to all of you for your great efforts and commitment.

I would also like to thank Henning Melber for his support and the opportunity to collaborate and produce this publication as a joint undertaking between the What Next Forum and the Dag Hammarskjöld Foundation. It was an enormous pleasure to again work closely with my former colleagues at the Foundation – Robert Österbergh, who helped with the editing, and Mattias Lason, whose creative and beautiful layout will surely boost the impact of the publication. Your dedication and attention to detail are invaluable. Likewise, it's been a true pleasure to work closely again with Wendy Davies, the Foundation's language/copy editor, as well as Peter Colenbrander who added support at a crunch time. You are true professionals, ensuring texts of the highest standard. Thanks also to Teresa Anderson of the Gaia Foundation, who read the manuscript and provided many valuable suggestions in addition to contributing her own article.

Thanks also to Olle Nordberg for your support and more than a decade of past work together at the Foundation. Nobody has provided more insights into how to convene meetings, edit publications, improvise and trust the process. You have made a considerable impact on this volume without really knowing it. And of course thank you to my children, Tova and Vidar: their generation and those to come are the ultimate reason for this volume.

Niclas Hällström
Uppsala, September 2012



What Next? Convening – Exploring – Catalysing

The What Next Forum is an emerging initiative that builds on many years of prior work on 'Another Development' and the What Next Project at the Dag Hammarskjöld Foundation. As a set of core activities the What Next Forum seeks to convene informal dialogues, roundtable discussions, exploratory seminars, strategy workshops, as well as public debates to facilitate a broad range of actors to meet each other in new constellations.

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F O R U M

The What Next Forum aims to explore new issues, challenges and alternative views on environment and development. The meetings strive to create opportunities for new thinking and exploration of unconventional ideas – and of possible trajectories ahead. Activities strive to catalyse promising ideas and initiatives into action. By convening meetings of actors and thinkers, the What Next Forum hopes to catalyse the formulation of strategies, help initiate networks and organisations, and provide active support to both policy-makers and activists.

More information about What Next Forum can be found at www.whatnext.org



Gulf of Mexico, June 16 2010

Fort Chipewyan, Alberta Tar Sands region, February 11 2012



Introduction

Niclas Hällström

Snapshot #1: Newspaper headings from a week in September 2012 as this manuscript was being concluded:

‘Vanishing Arctic ice is the planet’s white flag of surrender’

‘Global carbon trading system has “essentially collapsed”’

‘Caribbean coral reefs face collapse’

‘Research links extreme summer heat events to global warming’

‘Climate change growing threat to food and biodiversity’

Snapshot #2: A huge conference room and a world of its own: a fascinating, bewildering, and often deeply frustrating setting. Every living person in the world – and all future generations – supposedly represented here as the fate of the planet is being negotiated. All the power of the world crystallised in this one room, directly or indirectly represented by exhausted looking negotiators.

In many people’s views the UN climate negotiations are becoming less and less relevant. The lack of concrete results and concerted action stemming from the climate summits over the years feeds disillusion and cynicism. The complicated, mystifying, alienating policy language of incomprehensible abbreviations and acronyms – LULUCF, QELROS, REDD, GCF, MRV, AWG-LCA – distance the majority from the small group of technocrats, negotiators and lobbyists immersed in the details, tirelessly taking seemingly miniscule steps back and forth.

It is easy to argue that the real changes are happening anyway, outside of the Bella Centres, Moon Palaces or Durban Convention Centres where the yearly ‘COP’ climate summits take place. Transnational corporations, financial speculators, consumers, community organisers, progressive social movements and indigenous groups alike are shaping and reshaping the world – and ultimately our emissions and climate – regardless of the ideas, paragraphs and commas being fought over inside these UN halls.

Nonetheless, the UN negotiations do matter. The world is facing an emergency situation with a breathtakingly small and rapidly diminishing carbon budget. How should this atmospheric space be divided? It is hard to imagine a forum other than the UN that could provide space



for any kind of multilateral, fair and binding conversation about how this should be done. The alternative to a free-for-all, winner-takes-all scenario must sensibly include some kind of multilateral, ‘global governance’ approach. And the UN is what we have. Yet, within this framework there is now a lack of momentum, a shift towards weak voluntary commitments and a downgrading of equity principles. Meanwhile the planet continues to heat up and global inequities are growing. How did this happen? What are the trajectories ahead?

This What Next volume takes several points of departure.

A first departure point is the recognition of the severity of the situation we face, which demands that radical and far-reaching changes be made. The title of the first article, ‘Climate change going beyond dangerous – Brutal numbers and tenuous hope’, by one of Britain’s leading climate scientists, Kevin Anderson, captures this clearly. We must dare to ask difficult questions and draw some very unpleasant conclusions. It is a nightmarish predicament that we are in, and there is no way we can effectively deal with the challenges to the extent needed without fundamental changes in the way our societies work; including challenging power structures, the way we run our economies, and the very meaning of ‘development’ and ‘progress’.

Yet, in this grim situation lies hope, too. With the stakes so high – essentially the future of humankind (and ‘Mother Earth’) as we know it – and with ultimately everyone at peril, there is also an imperative for far-reaching change. As the contributions to this volume show, solutions do exist, and it is possible to envisage a much more equitable world that has collectively managed to drastically reduce its emissions, avoid truly catastrophic global warming and increase the level of happiness and genuine well-being. But, it is also clear that such a transformation of our societies will require an unprecedented set of changes. To conveniently trust that ‘business as usual’ in the hands of the most powerful vested and commercial interests will simply ‘fix’ the problems through new technologies and ‘cost-effective’ market solutions, is, in light of these articles, a recipe for disaster.

A second departure point is the recognition that equity must be at the centre of the debate. For many environment and climate policy makers and activists, equity concerns have been secondary to the overriding concerns about global warming. Many articles in this volume respond to this point directly, and make the case that ‘equity is the gateway to ambition’. This volume thus takes a normative approach in the broad notion of climate justice. However, within this approach it



UN Photo/Logan Abassi

A first departure point is the recognition of the severity of the situation we face, and that it demands that radical and far-reaching changes be made.

tries to nuance and map out different points of contention, contradiction and debate. For example, it shows the ethical, practical and pragmatic bases for India's strong stance on equity in the climate negotiations, but also problematises the notions of equity, elites and development models within India as well as the South more generally – thereby adding a layer to the equity battles raging at the intergovernmental level. While regarding equity as fundamentally and morally important in itself, the volume also holds that equity is a prerequisite for the drastic global emissions cuts that will need to take place over the next few decades. It is strikingly clear from these contributions that in particular the countries of the 'North' will have to face up to their responsibilities in order to break the current deadlock. Decades of failed promises, delaying tactics and shifting of goalposts have eroded the level of trust between the North and the South to an all time low. This needs to be rectified immediately, and can only be done through bold action and sincere commitments to equity.

Thirdly, the publication assumes that civil society has an important role to play. Cutting across the diverse set of articles are different approaches to, and understandings of, the way in which societies change. How will the substantial changes that are needed come about? While the volume does not seek to glorify or romanticise the role of social movements and civil society organisations, it recognises that many achievements and much 'progress' in human history have come about when people have organised and taken action from below. The end of slavery, women's equal rights, the civil rights movement, the welfare state, nuclear disarmament, the end of apartheid and many actions against environmental injustices would not have been possible without strong action by different constellations of civil society and social movements. Parliaments, government, business, academia and media are all crucially important, but are by themselves not likely to create enough momentum for the far-reaching change that is needed. A vibrant civil society – of concerned and engaged citizens – is needed to speak the truth, and to stake out and normalise what may seem 'radical' by today's political 'realism'. Civil society can and must create the momentum and pressure to move those in political power out of their comfort zones, in order to challenge what's blocking fair and equitable solutions.

Fourthly, this volume reflects a firm – and hopeful – conviction in the importance and power of dialogue. Although there are many substantive and fundamental points of disagreement in the climate debate that will not be overcome by talk alone, the power of dialogue is often underestimated. There is considerable scope for a more informed and balanced understanding of other parties' perspectives in the debates around climate change, and a strong case for presenting perspectives that are less heard. This volume

aims to stimulate critical dialogue and the emergence of more and new spaces for collaborative action, meetings and interaction.¹

My hope is that this volume will provide insights into the links between climate, development and equity to a diverse audience. It will hopefully help demystify the climate negotiations for those who are not following them closely, provide a richness of detail on a number of distinct issues for those engaged in negotiations, advocacy and policy work, and engage with challenging perspectives and inspiration around solutions and problems that are largely outside of the negotiations: from struggles against oil companies to ‘Transition Towns’. Hopefully the mix of contributions and approaches can stimulate important conversations – and tough debate – on many of these matters, and in all kinds of quarters.

The structure of the book

The volume is divided into four distinct parts: *Setting the Context: Climate Development and Equity Challenges*, *The Climate Negotiations*, *Real and False Solutions*, and *Movement for Change*

Part I, Setting the Context: Climate, Development and Equity Challenges, provides several departure points. Kevin Anderson, one of Britain’s most prominent climate change scientists, provides hard-hitting science, argues that policy-makers and fellow scientists alike tend to paint too rosy a picture and presents the brutal reality of the remaining carbon budget. The article that follows presents the notion of ‘climate debt’, a key concept emphasised by numerous countries and by civil society in recent years. In the concluding article, ‘The North-South divide, equity and development – The need for trust-building for emergency mobilisation’, Sivan Kartha, Tom Athanasiou and Paul Baer deepen the discussion of ‘equity’ and the ‘right to development’, and outline a principle-based framework for effort-sharing at the international level.

Part II focuses on the **UN Climate Negotiations**. Martin Khor shares an insider’s perspective of what took place during the climate summits of Copenhagen in 2009, Cancun in 2010, and Durban in 2011, highlighting the current ‘clash of paradigms’ and frustrations over both process and content that have effectively brought the process to a standstill. Other contributions shed light on the outcomes from Durban, ‘paltry’ pledges

Scott Liddell



¹ For example, carefully crafted dialogue seminars with diverse sets of people over several days, where trust and personal connections are allowed to develop, can indeed result in unexpected openings and creative understanding on how to move forward. Some recent dialogues with What Next involvement include policy discussions on biodiversity financing within the CBD context (www.dialogueseminars.net) and antibiotic resistance. Similar examples from prior work at the Dag Hammarskjöld Foundation include openings on progressive primary health care, indigenous publishing, carbon trading, politics of plant genetic resources, nanotechnology and equitable pharmaceutical drugs policies.

for emissions reductions currently on the table, rich country ‘loopholes’ as well as the need for climate finance. Contributions specifically reflecting on China and India conclude this part. Both of these countries have come under the spotlight and strong pressure, motivating Dale Wen and Praful Bidwai (from China and India respectively) to reflect on their countries both in terms of the UN negotiations and in relation to climate change more broadly. While exposing the problems with elite-driven, consumerist and growth-oriented development strategies that mimic the West, they also expose the problems and injustice of treating India and China as if they were similar to the US or Annex 1 countries – thereby connecting to the equity frameworks presented in Part I.

Part III, On Real and False Solutions, suggests that many of the most challenging debates and battles around climate change are, and will increasingly be centred around, what constitute ‘real’ and ‘false’ solutions. The section begins with an article by Larry Lohmann that metaphorically frames different approaches as ‘dead’ and ‘living’ solutions. Lohmann makes the crucial point that the inherent need for structural change in order to tackle climate change requires ‘creatively building long-term, coherent historical pathways away from dependence on fossil fuels’. Oscar Reyes shows why carbon trading causes societies to delay the bold investments required to move onto such new pathways and also highlights structural failures of current carbon trading schemes as well as new risks posed by a range of new ‘financialisation’ mechanisms. The ETC Group present the case against ‘geoengineering’ and argue why these mega-scale technological ‘fixes’ for climate change are inherently risky and ‘false’ solutions.

As a contrasting and bold, visionary solution, Doreen Stabinsky and Lim Li Ching discuss the huge potential for agroecological approaches to simultaneously decrease emissions and enable resilient, ecologically sound and socially appropriate agriculture. Finally, Tariq Banuri, Niclas Hällström and Pascoe Sabido reflect on the crucial importance of energy access and show how a globally funded programme for national feed-in tariffs for renewable energy could, if properly designed, be critical for a bottom-up energy revolution. Through such a bold public investment programme, the world could be transformed to one with universal energy access and 100 per cent renewable energy – precisely what is needed to tackle the global challenges of climate change, inequality and poverty.

Lastly, **Part IV** looks at **Movement Towards Change**. The introductory article, ‘Beyond patzers and clients’, issues a challenge to everyone, whether civil society activists, government representatives or academics, to (re-) consider our strategies and rationales and realise the risks of

becoming a ‘patzer’ – losing the overall game for the sake of short-term gains. Three short cases – ‘glimmers of hope’ – conclude the volume and provide inspirational accounts. First, a reflection on civil society and the UN, with examples of successful experiences of governments and social movements working together in unusual ways within the UN context; second, an account of local grassroots resistance struggles working with internationally connected movements to ‘keep the oil in the soil’; and third, the story of local development approaches through the rapidly growing phenomenon of ‘Transition Towns’.

★ ★ ★

It has been an incredibly rewarding – and challenging – task to bring together these diverse contributions. Needless to say, there are many more dimensions, authors and angles that could have been included. Nonetheless, I hope that this collection of articles does convey several strong and important messages: That humanity is facing its biggest challenges yet. That these challenges are fundamentally about equity, justice and different views about what ‘development’ should really be about. And that there can be no way out of our predicament without daring to question the status quo – and making the impossible possible.

What Next?

Niclas Hällström
What Next Forum
Uppsala, September 2012







**Part I » Setting the Context
– Climate, Development
and Equity Challenges**

Climate change going beyond dangerous – Brutal numbers and tenuous hope

Kevin Anderson



Keith Kris

If we are not honest about the situation we will continue to do nothing substantive... sticking our head in the sand and, despite the science and data, convincing ourselves everything is going to be all right.

I have called this article ‘Climate Change: going beyond dangerous’, as in my view and that of many of my colleagues, we are now in the process of going beyond what has traditionally been defined as the threshold between acceptable and dangerous climate change.

The subtitle of the piece, ‘Brutal numbers and tenuous hope’, refers to the maths and the quantification underpinning the analysis. The numbers are brutal and hard to accept, begging fundamental questions about how we live our lives – they are not numbers we want to hear. Translating the analysis into repercussions for society, it is evident there is now only a tenuous hope of making the substantive mitigation necessary in the rapidly diminishing time frame available.

Given the grave situation we have (knowingly) got ourselves into, we need to be honest, direct and clear as to the implications of our analysis. Only if we strip away the rhetoric and naive technological optimism surrounding climate policy can we have some hope of responding appropriately to the scale of the challenges we face. If we are not honest about the situation we will continue to do nothing substantive. Instead we will carry on with the same ineffective policies we have pursued for the past two decades – what I refer to as ‘cognitive dissonance’ (an academic disguise for hypocrisy – sticking our head in the sand and, despite the science and data, convincing ourselves everything is going to be all right).

The evidence however, is that we have been heading in the wrong direction for years and, more disturbingly, the situation is worsening rather than improving. Since the 1992 Rio Earth Summit, where the climate convention was brokered, we have witnessed a rise in emissions

year after year – not only that, but the rate of growth of emissions has also increased. If we are to turn this situation around we have first to acknowledge that despite numerous climate conferences, political soundbites and optimistic discussion of low-carbon technologies, we have abjectly failed to secure any control over emissions.

The void between rhetoric and reality

A prerequisite of responding to the climate challenge is exposing the void between the rhetoric and the reality around efforts to reduce emissions (mitigation). There is certainly plenty of discussion of mitigation, but seldom does it focus on the actual gap between the claims we make as individuals, companies, nations and a global community and what is actually happening in terms of absolute emissions. Buying a slightly more efficient car or improving the performance of supermarket refrigerators has nothing to do with solutions to climate change if we subsequently drive further or chill more of our food.

So what is climate change about? What are we responding to?

Internationally, there are a range of statements and declarations framing climate change and our agreed responses to it. First and foremost, the UN Framework Convention on Climate Change (1992) states in its Article 2 that:

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve... stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

The more recent Copenhagen Accord (UNFCCC, 2010) states the goal as to ‘hold the increase in global temperature below 2 degrees Celsius, and take action to meet this objective consistent with science and on the basis of equity’ (it even recognises the need to consider strengthening the goal to 1.5°C). This is a very clear statement – reiterated in the Cancun Agreements (UNFCCC 2011) – and an important backdrop against which to examine and quantify the scale of the policy challenge.

Looking to the EU, the European Commission (2007) reiterates the need to ‘...ensure that global average temperature increases *do not* exceed pre-industrial levels by more than 2°C’ and states that we ‘*must* adopt the

necessary domestic measures...’ to ensure that this is the case. Likewise, the UK’s Low Carbon Transition Plan (DECC, 2009) states that ‘average global temperatures *must* rise no more than 2°C’ (author’s italics).

This language is not about accepting a 50:50 chance of keeping to 2°C. The Cancun Agreement, the EU and the UK, all categorically state that temperatures must rise no more than 2°C. Understanding the probability of staying below (or of exceeding) 2°C is pivotal to any informed discussion of mitigation – an absence of clarity on this issue risks confusion and inappropriate policies. As it is, policy-makers (along with many academics and climate specialists) repeatedly make statements, emphasising the importance of staying below 2°C whilst at the same time proposing policies that imply a very high chance of exceeding 2°C. It is from here that much of the void between climate rhetoric and actual mitigation policies emerges.

What does 2°C mean?

The framing of 2°C refers to the global mean surface temperature rise compared to the pre-industrial period. Since then, and due to the burning of fossil fuels, greenhouse gas concentrations in the atmosphere have continued to increase and temperatures have gradually risen.



A 2°C average rise may not sound too bad if you live in the UK, for example. However, the regional repercussions vary considerably. An average warming of 2°C might mean that temperatures at the poles rise by up to 6°C and parts of Africa experience considerably higher warming than many other regions (May, 2006). Furthermore, most of the planetary surface consists of oceans, and water has a high capacity for absorbing heat, so an average global rise of 2°C may correspond to an average land-based temperature rise of 3°C – triggering marked changes in temperature and precipitation patterns. The repercussions of an average 2°C warming reach deeper than we tend to imagine.

Why has a 2°C rise become the focal point of climate change discourse?

Over the past decades, many scientists have explored the various impacts associated with changes in global and regional temperatures. More re-

cently these have been summarised and brought together to provide a succinct management and policy tool to help guide decision-making. The impacts have been summarised according to five different categories¹ with each category coloured along a continuum from white (acceptable) to red (dangerous)(Figure 1). Through a slow process of engagement between scientists, policy-makers, companies and civil society, 2°C has become established as a ‘guard-rail’ between acceptable and dangerous levels of climate change. While impacts resulting from temperature rises below 2° are not, on average, considered desirable either, it is widely, and often tacitly, assumed that they are somehow manageable and tolerable.

The first assessment of these impacts was made in the late 1990s and early 2000s (the left-hand graph). When the impacts were revisited in time for the Copenhagen climate summit in 2009, the scientific under-

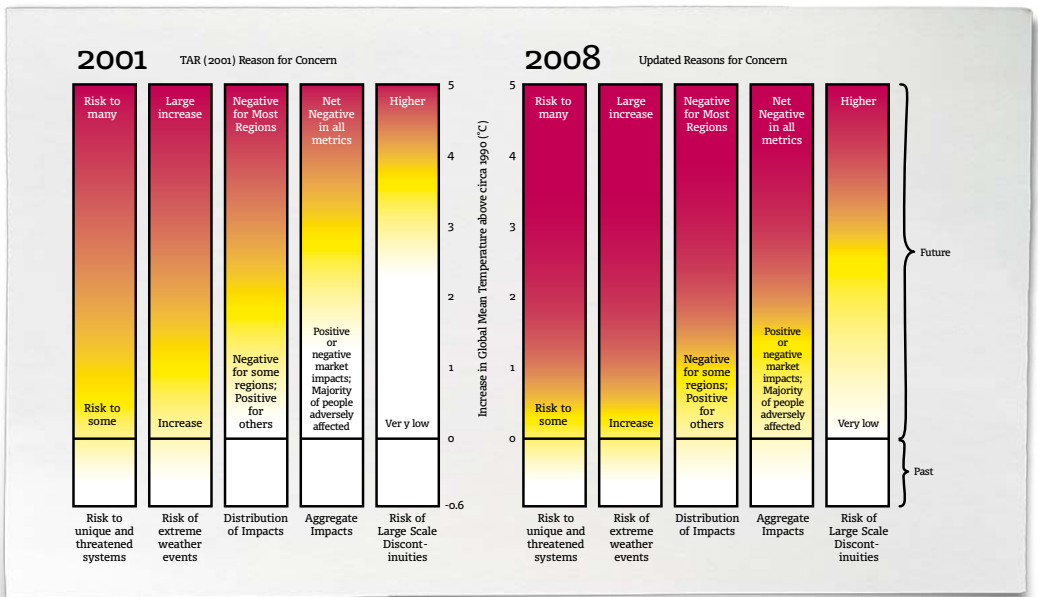


Figure 1: The impacts of 2°C are more serious than previously understood. More recent impact analysis suggests 2°C represents the threshold between dangerous and extremely dangerous, rather than between acceptable and dangerous climate change (Smith et al, 2009).

standing of global warming impacts had advanced, with all of the bars demonstrating greater impacts for any given increase in temperature. Not only do the impacts occur earlier than had been thought, but the set of impacts considered to be just about acceptable corresponds with much lower temperatures. The conclusion is clear. The impacts of 2°C are more serious than previously thought, and consequently the 2°C guard-rail lies in far more dangerous territory. If the logic of defining 2°C impacts as dangerous is to hold, the more recent impact analysis

¹ Risks to unique and threatened systems, risks of extreme weather events, distribution of impacts, aggregate impacts and risks of large-scale discontinuities (i.e. ‘tipping points’).

suggests 2°C represents the threshold between dangerous and *extremely* dangerous, rather than between acceptable and dangerous climate change. Certainly, it could reasonably be argued that 1°C rather than 2°C should become the *de facto* appropriate target.

If one accepts the rationale of safeguarding against dangerous climate change it is difficult to argue against a 1°C goal from a scientific point of view. However, from a practical, political point of view, it is almost impossible to imagine us now stabilising at 1°C, given what we have emitted into the atmosphere already. Even if all emissions were immediately stopped, 1°C would likely be exceeded. In other words, 2°C, perhaps 1.5°C, poses a limit of what we could plausibly aim for. At the same time, we should bear in mind that we have consistently and abjectly failed to set a course that would ensure remaining below even 2°C.

What are the implications of 2° warming?



Daniel Silva

The problem with 2050 targets is that they conveniently give the illusion that we can carry on with what we are doing and pass the problem on to future generations.

Since the temperature goal of 2°C has significant political momentum behind it, let us turn to the question of what this entails, politically and socially. What degree of mitigation – what level of carbon reduction – is necessary to stay at or below a temperature rise of 2°C? Asking this question raises an associated question. How should a global carbon budget be distributed between Annex 1 (broadly OECD countries) and non-Annex 1 (broadly non-OECD) countries, between industrialised parts and the industrialising and less wealthy parts of the world? With respect to the first question, there are many long-term targets that sound ambitious. For example, the UK has committed to reductions of 80 per cent CO₂ equivalent by 2050. The EU has adopted a similar goal, while the 2007 UN climate negotiations in Bali concluded that cuts of 50 per cent in global emissions by 2050 are necessary. The problem with 2050 targets is that they conveniently give the illusion that we can carry on with what we are doing and pass the problem on to future generations. A 2050 goal is convenient for policy-makers, companies and the public alike – it does not interfere with decision-making, immediate business issues or how we live our lives. Indeed, the lure of long-term targets is considerable. Unfortunately, there is no basis in science for banking on the problem being solved through technology, by someone else, in the future; disturbingly, many scientists have used this inappropriate shorthand and continue to do so.

The CO₂ that we release into the atmosphere today will remain there for well over 100 years. Therefore, a target of cutting 2050 emissions by a given percentage does not directly correspond to how much the

temperature will rise and whether we will avoid dangerous climate change or not. (Imagine, for example, continuously high emissions for decades followed by a sharp drop just in time to meet the 2050 target.) For long-lived gases such as CO₂ and many other greenhouse gases, *cumulative* emissions, the stock that builds up in the atmosphere, is the quantity that matters. Every day we turn the lights on, every time we drive a car we add to the accumulating stock of atmospheric CO₂. Our cumulative emissions – and our *carbon budget* – are pivotal to understanding temperature and climate change. This insight is fundamentally important; it exposes how inadequate it is to aim for long-term, gradual reductions to be delivered by future technology while highlighting the need for urgent and radical reductions that we need to bring about now. That is obviously much less attractive. Hence we shy away from addressing cumulative emissions. We much prefer to stick to long-term targets. They may prove meaningless with respect to global warming but they are tailored to cater for our cognitive dissonance. Bringing in the science reveals what we are not prepared to countenance – that we have to make changes to our lifestyles today.

What is the scale of the problem?

How, then, does a scientifically literate carbon budget approach change the scope of necessary mitigation?

To begin with, it is necessary to factor in the latest emissions data. It is clear that the situation is deteriorating, at a very fast rate. Figure 2 shows global emissions of CO₂. The graph rises in a dramatic way and the rise is connected to a wide range of phenomena, from the stuff we consume – the plasma screens we buy, how many cars and how far we drive, how many refrigerators we have – to the growth in population and so on. If any other species exhibited this same exponential pattern, we would know it was headed down a genetic cul-de-sac and faced a sticky end. The belief that it is possible to endlessly pursue such growth of everything and that the human species is somehow clever enough to defy the laws of science and physics betrays a certain arrogance in our collective imagination.

Over the last 100 years, CO₂ emissions have grown by about 2.7 per cent a year. Despite considerable discussions about climate change, particularly since the Earth Summit in Rio in 1992, emissions have gone up rather than down, as one might have expected. In fact, even the *rate* of increase has gone up. Between 2000 and 2007 the rate of increase was 3.5 per cent,

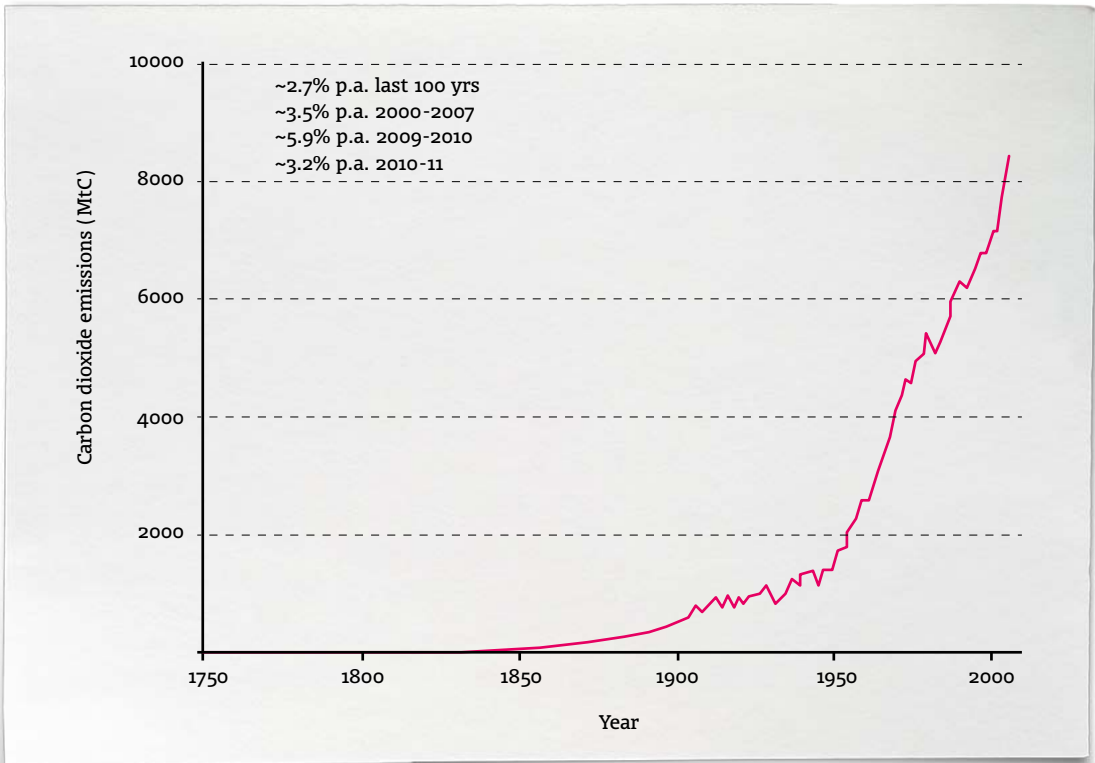


Figure 2: Not only are emissions growing, but also the rate of increase.

despite the considerable attention global warming had in this period.² In absolute terms this means vast increases, as the increase is exponential; that is, every year the growth rate is working on a larger number.

It is true that the economic crisis slowed emissions down, but less so than people generally believe, and only for a short period. The latest data reveal that for 2009–2010 emissions rose by 5.9 per cent, and for 2010–2011 by 3.2 per cent – despite the economic slowdown in many of the industrialised nations. Regaining ground that was lost in the recent economic downturn might account for part of the increase, but the underlying message is that we are more likely to see higher rates of increase as the industrialising parts of the world (non-Annex 1 countries) – particularly China and India, the producers of a large part of the goods consumed in the West – drive up emissions. Without radical and immediate mitigation, we are likely to see global emission increases of 3–5 per cent per year from 2012. We are fast heading in the wrong direction, accelerating towards the cliff rather than breaking and steering away from the edge.

2 Based on CDIAC data (Carbon Dioxide Information Analysis Center) <http://cdiac.ornl.gov/>

What are possible emission reduction pathways?

In light of our failure to reduce emissions, what does the science on cumulative emissions say about the mitigation efforts necessary now for 2°C.

Firstly, the earlier emissions peak the better. Generally, if emissions peak sooner, post-peak reductions need not be as drastic as for a later peak date. Coming off the peak will be the hard part, demanding continuously reducing emissions every single year while politicians and much of society are trying at the same time to foster economic growth.

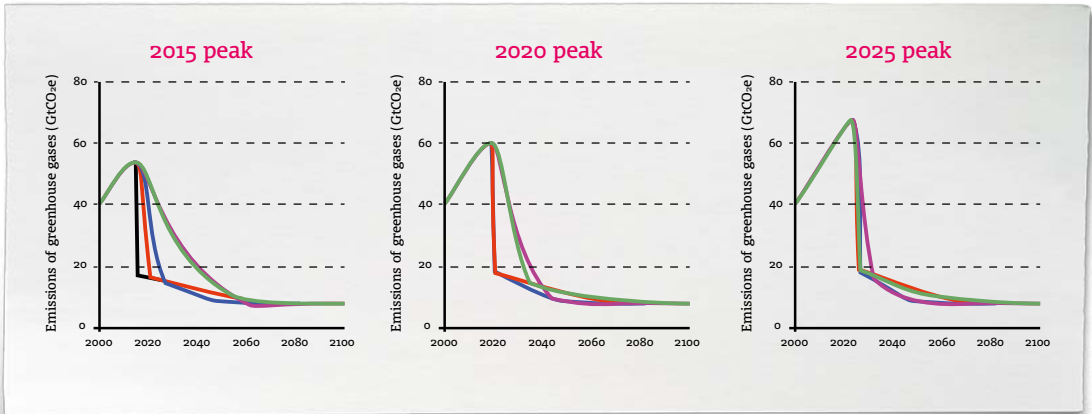


Figure 3: Possible emission reductions pathways based on different years of peaking. The scientific uncertainty about the exact correlation between emissions levels and the resulting temperature increase is represented by the different coloured curves. Curves of the same colour correspond to the same cumulative emissions budget. (Anderson & Bows, 2008)

The three graphs in Figure 3 visualise different pathways based on different peaking dates. It is important to note that emissions in all of the scenarios continue to increase before they reach a global peak in 2015, 2020 or 2025, respectively. There remains considerable scientific uncertainty about the relation between greenhouse gas emissions and resulting temperature increases, reflected in the set of different coloured curves in the graphs. But even the least demanding, most hopeful curves become horizontal and flatten out from around 2050. The reason is that emissions from all activities would have to be zero by then, with the exception of food production. Even allowing for efficiency improvements in agriculture it will not be possible to feed the world’s population, projected to reach 9 billion by mid-century, without significant emission of greenhouse gases. Even if tractors run carbon free, the use of fertilisers and simply tilling the soil releases greenhouse gases into the atmosphere. These emissions absorb a substantial part of the 2°C budget, putting further pressure on the energy sector to reduce emissions immediately.

The key point is that curves of the same colour correspond to the same cumulative emissions budget. In the first graph, emissions peak in 2015, as assumed in the Stern report. Many consider it highly unlikely that global emissions can peak as soon as 2015. Emission curves in the second and third graph peak in 2020 and 2025, respectively. Because cumulative emissions are the same in all three graphs, the post-peak reductions are much steeper for a later peaking date. Furthermore, if emissions grow unchecked until the peaking date some cumulative emissions budgets are impossible to achieve, so the graph on the right contains fewer curves than the graph on the left.

A closer look at the 2020 graph reveals different estimations of what a 50:50 chance of avoiding exceeding 2°C warming would entail. The least demanding set of curves still require radical emission reductions of about 10 per cent year upon year from 2020 and continuing for around two decades. This is the scale of the challenge if we are to retain even a 50:50 chance of not exceeding the 2°C threshold – that is, to avoid what arguably constitutes *extremely dangerous* climate change.

This is not a promising outlook, and it looks even starker once unavoidable emissions from food production and deforestation emissions are subtracted to show the space left for energy-related emissions: subtracting them from the green and purple curves in Figure 4 yields the curves in Figure 5. Note that the curves in Figure 5 correspond to the same amount of cumulative emissions (the most optimistic case with respect to what is needed to avoid global warming in excess of 2°C) and only differ in their assumed deforestation scenario. Which-

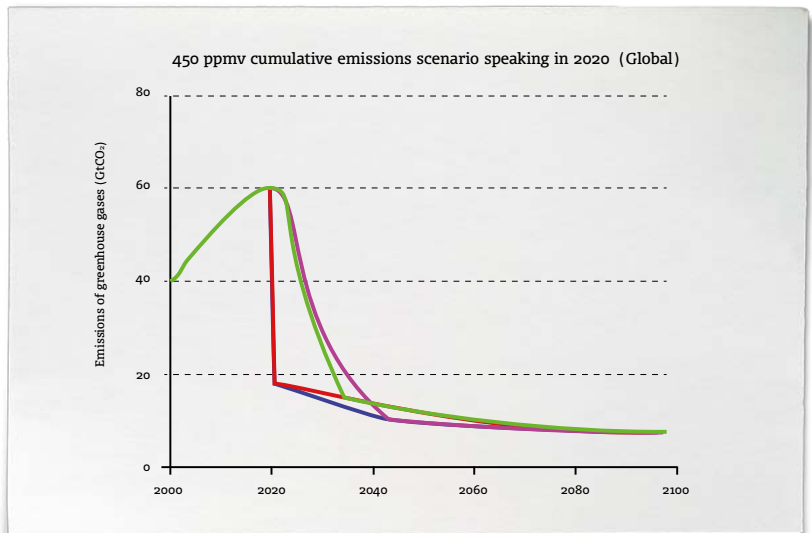
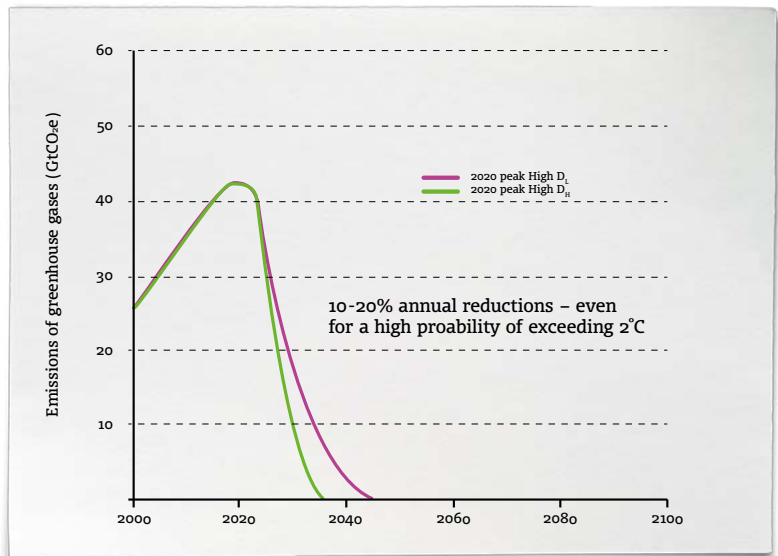


Figure 4: Even the least demanding set of curves still require radical emission reductions of about 10 per cent year upon year from 2020 and continuing for around two decades. (Anderson & Bows, 2008)

ever of the two very optimistic deforestation scenarios is chosen, global energy-related CO₂ emissions have to decrease by 10–20 per cent per year, hitting zero between 2035 and 2045. Flying, driving, heating our homes, using our appliances, basically everything we do, would need to be zero carbon – and note, zero carbon means zero carbon. Carbon capture and storage could not, as we understand them today, get near to delivering this.

Figure 5. When taking unavoidable emissions from food production and deforestation emissions into consideration, global energy-related CO₂ emissions have to decrease by 10–20 per cent per year from a peak in 2020, hitting zero between 2035 and 2045.



Reduction rates of 10–20 per cent are unprecedented – there are no appropriate analogues for this level of mitigation. The Stern report (Stern, 2006) concludes that cuts in emissions greater than 1 per cent have historically been associated only with economic recession or upheaval. Although there was a considerable shift to gas-powered electricity in the UK and a massive increase in nuclear energy production in France, both countries saw only small emission reductions as their economies continued to grow. When factoring in emissions from international shipping and aviation, which are currently not included under the Kyoto Agreement, there was no meaningful reduction of emissions, only a temporary slowing of the rate of growth. The disastrous collapse of the Soviet Union triggered 5 per cent year-on-year emission reductions for about 10 years – a rate just half to a quarter of what is necessary to give us a 50:50 chance of achieving the 2°C goal (Anderson and Bows, 2008). In 2012, with emissions at a historically high level and with economic growth driving emissions still higher, we simply have no precedent for transforming our economies in line with our commitments to avoid dangerous (or even extremely dangerous) climate change.

Why does this sound different from the standard analyses?

Virtually all mainstream analyses assume that emissions will grow by only 1–2 per cent per year before peaking. In reality emissions are growing nearer to 3–5 per cent per year and are set to continue, with nothing in train to curtail this level of growth. The UK Committee on Climate Change (CCC) is just one of many organisations from across the climate change community that relies on such modelling assumptions for its policy recommendations.

Virtually all mainstream analyses also assume emissions will peak within the period 2010–2016 (with the occasional outlier at 2020). The Stern report specifies the year as 2015; the CCC’s work is premised on a 2016 peak; and the recent report on adaptation and mitigation (ADAM) from the EU similarly assumes that emissions will peak in 2015 (Stern, 2006; CCC, 2008; Hulme et al., 2009). Studying the actual emissions globally, the question must be asked whether any of these assumptions of low growth rates and early peaking dates represent an adequate illustration of short-term reality. It is worth noting that a 2015/16 peak in global emissions implies that emissions from China and India peak by 2017/18; yet no analysts suggest this is, in any respects, either reasonable or equitable. In brief, almost all orthodox, low-carbon emission scenarios are premised on implicit assumptions about emission peaks for non-Annex 1 nations that few, if any, analysts considers appropriate.

Turning to post-peak emission reduction rates, our estimate of a required 10–20 per cent per annum reduction (from energy) is far more challenging than the estimates suggested in most other analyses, where rates are typically 2, 3 or 4 per cent per annum. As it stands, it is difficult not to conclude that the delusion of absurdly low emission growth and early peaks is maintained to facilitate post-peak reduction rates compatible with economic growth.

A more specific dividing line can be drawn between our analysis and that of Stern, the CCC and others, who suggest that large-scale supply-side technologies (new nuclear energy or coal with carbon capture and storage) will solve the problem. This begs the question of how possible and likely it is that supply-side technology could be put in place fast enough for emissions to come off the curve in time to avoid global warming of more than 2°C.

This is not to say that technology is unimportant. Quite the contrary, appropriate technologies are a prerequisite for achieving a low-carbon future – but they are not in and of themselves adequate or sufficiently

timely. Reductions are needed urgently and large-scale technology cannot deliver under such temporal constraints.

Behavioural changes *could* bring about a faster transformation, as might some ‘demand- side technologies’, but there simply is no way of getting the supply-side technologies in place fast enough in the wealthier parts of the world. Sokolow’s famous wedges could have worked if the process of change had been initiated earlier (that is, a much lower reduction rate would have been sufficient – a rate that a gradually increasing wedge, or wedges, of mitigation might have been able to deliver – see Figure 6).

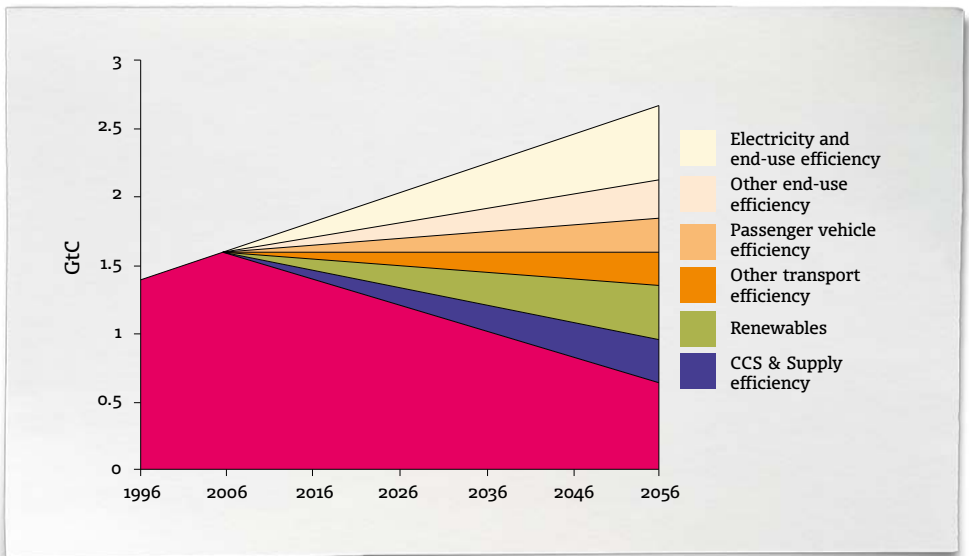


Figure 6: Sokolow’s wedges – not enough and too late.

Where we are now, we need some wedges that are the other way around, with the broad side yielding substantial emission cuts almost immediately. Because we are addressing climate change at such a late stage we cannot solely rely on supply-side technology wedges, and wait for them to grow to a significant level.

The analysis offered in this article also challenges the standard economic – or, more precisely, the narrowly constrained financial – characterisation of the problem; we have left it so late to respond that net costs are now essentially meaningless. We live in a non-marginal world, where very large changes are already occurring, both in terms of impacts of a changing climate and of societal responses and stresses, whether in relation to mitigation or adaptation. These step-changes will only escalate as global warming proceeds. Conventional market economics is premised on understanding and making small (marginal) changes. But with



Anja Ranneberg

With global warming, we are dealing with non-marginal, major changes occurring very rapidly.

climate change, we are not talking about small changes; we are dealing with a world of very large changes, outside the realm of standard market theory. In physics, Newtonian principles are deployed to understand how a car works, but in order to understand subatomic particles physicists turn to a different theoretical framing of the problem – quantum mechanics. By contrast, neoclassical (market) economists continue to propose marginal-based theories of small changes, regardless of the scale of the problem; this is not only academically disingenuous but also dangerously misleading. With global warming, we are dealing with non-marginal, major changes occurring very rapidly; a type of problem that market economics is ill-equipped to address.³ That is not to say that costs, and particularly prices and market economics, cannot be helpful in dealing with niche aspects of climate change; but they are not helpful in addressing the overall challenge.

What would a 4°C world mean?

The current situation is highly precarious. It is easy to resign and claim that the necessary changes are impossible to achieve and that we are going to have to live with higher temperatures. For this reason, it is important to examine what these higher temperatures mean. Let us imagine a 4°C future, the level of warming we seem to be heading towards, if not more.

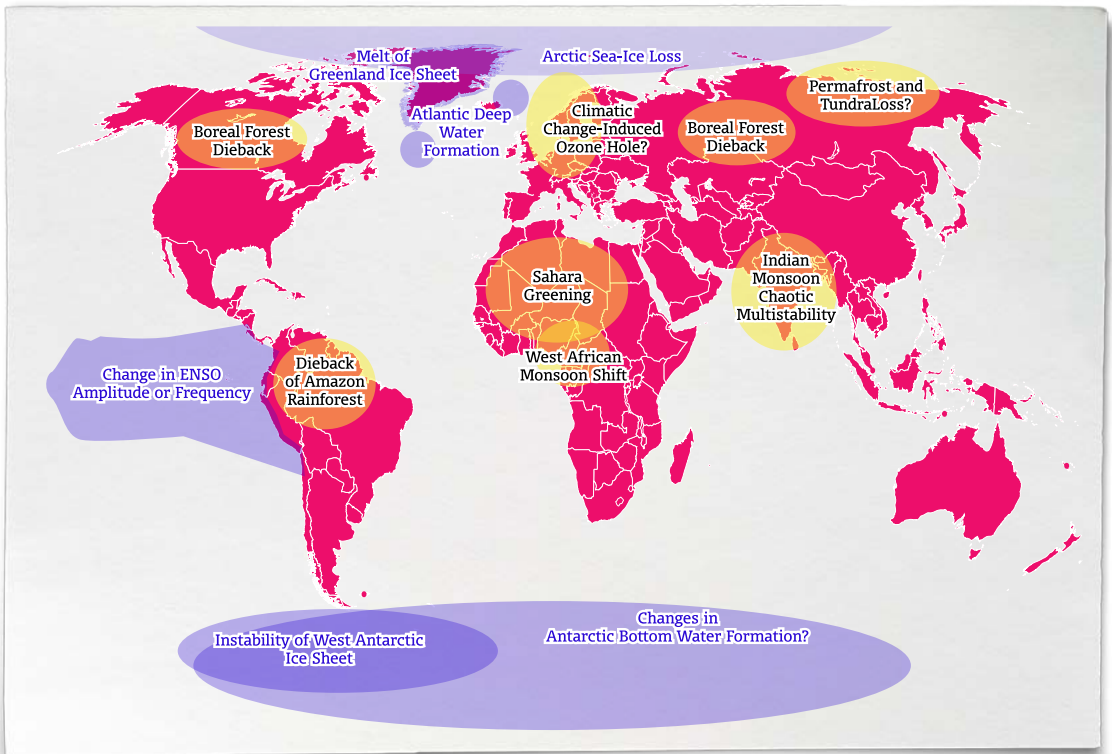
Let's look at a snapshot of a 4°C world. A *global* mean surface temperature rise of 4°C equates to around 5-6°C warming of global mean *land* surface temperature. According to the UK's Hadley Centre (Sanderson, 2011; New, 2011) a 4°C world would likely see the hottest days in China being 6-8°C warmer than the hottest days experienced in recent heat waves that China has struggled to cope with; Central Europe would see heat waves much like the one in 2003, but with 8°C on top of the highest temperatures; during New York's summer heat waves the warmest days would be around 10-12°C hotter – all as a consequence of an average global warming of around 4°C. As it is, our infrastructures and our way of living are not attuned to these temperatures, with the very real prospect of dire repercussions for many – particularly for vulnerable, communities.

³ Not only are immediate, substantive and system-wide investments in low-carbon infrastructure required but these also need to be accompanied by a rapid transition to low-carbon practices. At the same time, there are early signs that the impact and adaptation facets of climate change are delivering non-marginal change – made all the more difficult by many of these changes being across national and cultural boundaries – boundaries where cost/benefit analysis and other market-valuation tools are inappropriate at best and divisive at worst.

At low latitudes, 4°C would result in reductions of around 30–40 per cent in the yields of important staple crops such as maize and rice, at the same time as the population heads towards 9 billion by 2050.

It is fair to say, based on many (and ongoing) discussions with climate change colleagues, that there is a widespread view that a 4°C future is incompatible with any reasonable characterisation of an organised, equitable and civilised global community. A 4°C future is also beyond what many people think we can reasonably adapt to. Besides the global society, such a future will also be devastating for many if not the majority of ecosystems.

Beyond this, and perhaps even more alarmingly, there is a possibility that a 4°C world would not be stable, and that it might lead to a range of ‘natural’ feedbacks, pushing the temperatures still higher (Lenton, 2008).



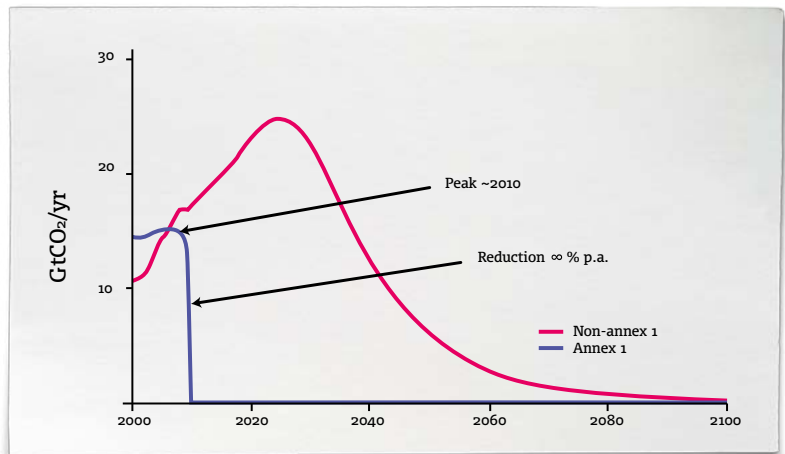
‘Map of potential tipping elements in the climate system (based on Lenton, 2008)’.

A fair deal for non-Annex 1 countries – what’s left for Annex 1?

Across the global community we continue to strive for economic growth. But this needs to be balanced with a limited and rapidly shrinking emissions cake; a cake that needs to be divided between the industrialising (non-Annex 1) and industrialised (Annex 1) nations.

My colleague Alice Bows (Sustainable Consumption Institute, University of Manchester) and I have analysed how far it is possible to push non-Annex 1 countries in terms of their emissions, and then see what is left for the Annex 1. Underlying the analysis as presented here, is a global emissions budget corresponding to a 40 per cent likelihood of exceeding 2°C (i.e. not a very ambitious scenario in relation to the risks involved). Figure 7 shows an emissions trajectory for non-Annex 1 countries over the 21st century. Emissions grow (with a tiny dip at the economic downturn in 2008) to a peak in 2025, at a growth rate of 3.5 per cent per annum, much lower than the 6–8 per cent growth in emissions that we are actually seeing in China, for example. Following the peak in 2025, emissions decrease at 7 per cent every year, twice the rate that the Stern review and most economist’s claim is the limit within a growing economy. So we are already positing a very challenging curve for the non-Annex 1 nations.

Figure 7: Even with a very challenging emission reduction trajectory for non-Annex 1 countries there are literally no emissions left for Annex 1 countries (Anderson & Bows, 2011)



What then is left for Annex 1 countries in this scenario? The blue curve illustrates the blunt reality: in 2010 Annex 1 countries had no emissions left. This means that we would have to switch the lights off today; in fact, we should have switched them off yesterday. It means we could not have taken the car home from work yesterday, and will be stuck in the office tonight. When we do get home – stepping off our bicycle – we should cancel our flight to the south of France, which is the last thing

we do on the laptop before the battery runs out – or try to do, because we fail as the internet is down. There is literally no emissions space left for those of us in the Annex 1 parts of the world, in order to have a roughly 50:50 chance of staying below 2°C temperature rise; of avoiding *extremely* dangerous climate change.

This is a challenging situation, to say the least. But even this non-Annex 1 pathway may be too optimistic. To better understand the reality of current emissions, it is vital to pay careful attention to emissions from China and India, in particular. There is often a naivety underlying the dominant Western ways of analysing these issues.

China's annual fossil fuel emissions are about 7.5 gigatonnes of CO₂, around a quarter of the global total. The Chinese GDP growth rate has a 10-year trend of about 10.5 per cent per annum.⁴ Some economists believe this growth rate cannot be sustained much longer, but they have said so for a long time, while the rate has still been achieved. China has been very successful in maintaining strong and sustained economic growth, and it is certainly not planning to bring it to a halt just now. India's emissions are about the same size as Japan's (about 6 per cent of the global total each), having grown at about 7.5 per cent per annum over the past decade. The rate of growth of emissions is lower than China's, but still significant.

The question is if and how long this can continue. Shanghai and Beijing have a similar GDP per capita as the average OECD country. However, there are 200 million people in China who earn less than US\$1.25 per day and about 250 million people who earn between US\$10 and US\$20 a day. There is thus a large, untapped reservoir of people to sustain China, potentially, as a major industrial powerhouse, with substantial economic and emissions growth, for many years to come.

The Chinese GDP per capita measured in the market exchange rate (which is not a perfect measure but acceptable for these purposes) is about 5 per cent of the OECD average. Although citizens of Shanghai and Beijing (which have a combined population of about two thirds of that of the UK) are on average as wealthy as the average UK citizen, the average Chinese person has only about 5 per cent of the income of the average person living in one of the OECD countries. India's income per capita is even lower, around 2 per cent of the OECD average and just over a third of China's. All this suggests that there is considerable potential for continued economic growth in these countries. The emissions likely to accompany this growth could see us going well beyond what is currently accounted for in either our or the standard emission scenarios.

4 Based on CDIAC data (Carbon Dioxide Information Analysis Center) <http://cdiac.ornl.gov/>

Assuming China meets its 12th five-year plan along with its other promises to reduce its emissions intensity, it is likely to account for about one-half of the world's CO₂ emissions by the early 2020s. If these growth rates were to continue, by 2030 China alone would emit as much as the rest of the world today.



Most of the low carbon integrated assessment models informing governments around the world have emission peaks between 2005 and 2016. However, away from the headlines and microphones, few, if any, of those working on climate change consider these early peaks or accompanying low-emissions growth as either viable or appropriate.

Are these assumptions reasonable? Many Chinese scholars expect the emissions to peak in 2030 and then probably plateau. The minimum growth rate of emissions to peak is often assumed to lie between 5 per cent and 7 per cent, much higher than in current models that assume just 1-2 per cent growth to a very early peak. There is a large discrepancy between the numbers in Western models and scenarios, and those considered appropriate by many Chinese academics; and it may seem plausible that Chinese experts have a more robust understanding of China's actual emissions.

The situation looks similar for India. Assuming India will follow a pathway that is comparable to China's, its emissions will be about 3.5Gt by 2020 and could amount to 7Gt by 2030. Many Indian experts on climate change suggest that energy-related emissions will peak after 2030, again in stark contrast to the numbers in the established Western models. All of this, then, has serious implications for mitigation and adaptation analysis and subsequently policy, globally and for all nations around the globe.

Putting these numbers together results in a world that looks completely different from the one that the Committee on Climate Change envisages, where emissions from China and India are assumed to peak by around 2017. Most of the low carbon integrated assessment models informing governments around the world have emission peaks between 2005 and 2016. However, away from the headlines and microphones, few, if any, of those working on climate change consider these early peaks or accompanying low-emissions growth as either viable or appropriate.

2°C – a political and scientific creed?

I would argue that the 2°C target is underpinned by what may be termed a political and scientific creed rather than by an updated consideration of the climate science. The prevailing orthodoxy that informs policy-makers is couched in a 'can-do' language, far removed from the reality we are facing. There are many examples:

'It is possible to restrict warming to 2°C or less... with at least a 50% probability.'

The AVOID programme (AVOID, 2009)

‘[For 2°C it is necessary that] the UK cut emissions by at least 80%...by 2050. The good news is that reductions of that size are possible without sacrificing the benefits of economic growth and rising prosperity.’

UK Committee on Climate Change (CCC, 2008: p.xiii&7)

‘...a low stabilisation target of 400 ppm CO₂e can be achieved at moderate cost...with... a high likelihood of achieving this goal.’

Adaptation and mitigation strategies: supporting European climate policy (ADAM) report (Hulme et al., 2009: p.19)

But using the same science, very different conclusions can be drawn, as I have pointed out in a paper co-written with Alice Bows. As a contrast, we state:

‘...it is difficult to envisage anything other than a planned economic recession being compatible with stabilisation at or below 650 ppm CO₂e.’ [i.e. ~4°C]

(Anderson and Bows, 2008)

In a more recent paper we conclude:

‘...the 2015–16 global peaking date (CCC, Stern & ADAM) implies...a period of prolonged austerity for Annex 1 nations and a rapid transition away from existing development patterns within non-Annex 1 nations.’

(Anderson and Bows, 2011)

These are radically different interpretations of the same science. In summary, the ‘established’ models differ from ours in terms of:

- » The understanding of/accounting for historical emissions. These have sometimes been mistaken or, worse, possibly massaged, to provide acceptable data and trends for the more orthodox analyses.⁵
- » Short-term emission growth is seriously downplayed within virtually every single low-carbon model.

5 Factoring 20th century emissions from Annex 1 nations into calculations of the ‘fair’ emission space available for Annex 1 in the 21st century would leave Annex 1 nations already in ‘emission debt’. Whilst such an outcome may have [some] moral legitimacy, it evidently would not provide for a politically consensual framing of emission apportionment. However, the implications of including 20th century emissions and the concept of emission debt may guide the scope and scale of climate-related financial transfers (arguably as reparation) between Annex 1 and non-Annex 1 nations.

- » The choice of peak year is Machiavellian at worst, but even at best, the idea that the peak will take place as early as projected is dangerously misleading.
- » The assumed reduction rates are dictated by economists, and this is pivotal to why the early years of these analyses are unrealistic.
- » The emission floors – that is to say, the emissions from food – are poorly understood, although some analyses, such as the UK Committee on Climate Change, deserve credit for seeking to embed this dimension in their work.
- » Deploying geoengineering schemes to reduce carbon emissions is assumed to play a role. It may be that some of these technologies end up being viable options in the future, but to embed them in almost all low-carbon analyses is unacceptable. At the moment these are at the fringe of our understanding and very risky and speculative, at best. It's unreasonable and irresponsible to have these as ubiquitous and unquestioned in our carbon models.
- » The split between Annex 1 and non-Annex 1 countries, between the industrialised and the industrialising world, is neglected or hidden in many analyses.
- » There are many optimistic assumptions about 'big' technologies coming forward. Originally trained as a mechanical engineer, I see engineering as a solution to a number of issues, but I also recognise that we cannot deploy large-scale technological schemes fast enough, and that large-scale technological schemes are always associated with social, cultural and ecological realities on the ground that necessarily take considerable time to deal with in a fair and sustainable manner.

Lastly, the linear understanding of the problems held by many – for example, the idea that 4°C means a doubling of the impacts of 2°C, and that if we do not act now, it is ok because we can do so in the future – is scientifically unfounded. This does not work with a complex, dynamic system such as the climate system. Global warming is a cumulative problem – if we do not act now, we are committing the future to certain levels of climate change.

It is imperative not to be dissuaded from purposeful and effective action by a mood of pointless despair. There are many things we can do to attempt to keep to around 2°C, and if this is not possible in the end, then we can at least move in the right direction.



Fernando Weberich

Before despairing

Admittedly, all of this may seem very bleak. But it is imperative not to be dissuaded from purposeful and effective action by a mood of pointless despair. There are many things we can do to attempt to keep to around 2°C, and if this is not possible in the end, then we can at least move in the right direction. What I truly want to convey in this article is that we *can* act. So, let us conclude with some pointers of where real change may come from – of the opportunities to initiate early and substantive levels of emission reduction.

In summary, following our previous analysis, science tells us that for an outside chance of 2°C Annex 1 countries need to reach emission reductions of the order of about 40 per cent by 2015, 70 per cent by 2020, and over 90 per cent by 2030, with similar reductions globally with a lag of a decade or two – a disturbingly short time frame. These numbers are strikingly different from the sort of numbers we traditionally see. The typical response is: ‘That is impossible’. In response, we need to ask: Is living with a 4°C global temperature rise by 2050 or 2070 less impossible?

Many people believe that we cannot reduce emissions at these rates, but it is crucial to stress the fact that we almost certainly are unable to adapt to the temperature increases that are likely if we do not cut our emissions drastically. There is no easy way out of this predicament, and we should not pretend that we are awash with win-win or green growth opportunities. Ours is now a world of very difficult futures, and the sooner we acknowledge this, the sooner we can seriously address the challenges we face.

So what can we do?

First, let us consider the question of equity before, second, turning to technology.

Equity

There are presently 7 billion people on the planet. But how many of these people need to make a substantial change in terms of their emissions of CO₂ and other greenhouse gases?

Consider Pareto’s 80–20 rule, which states that 80 per cent of something relates to 20 per cent of those involved – a surprisingly useful and robust rule of thumb. Applied to climate change this would mean that 80 per cent of emissions derive from roughly 20 per cent of the population. This relationship holds fairly well within different nations as well as globally. What if we then look at the 20 per cent group and apply Pareto to them

– and then repeat the process again? What we find is that about 50 per cent of the world's emissions come from about 1 per cent of the world population. Admittedly, this is a very rough calculus; it could just as well be 2 or 3 per cent of the global population responsible for 40 per cent of the emissions or 1 per cent for 60 per cent, but it provides a broad guideline.



There need to be policies tailored to reduce the emissions of the 1 per cent, 2 per cent – or even 10 per cent – who are emitting significantly and disproportionately, rather than universal approaches that impact all 7 billion of the population – 80 to 90 per cent of whom are already very low emitters.

Certainly, the bulk of the emissions come from a small percentage of the world's 7 billion people. Yet, in the West, one often hears statements such as 'Oh yes, but the Chinese! They are becoming rich. Everyone wants a fridge and a car...'. It is true that people want these things. But by the time the mode person (not the mean) – that is, the 'normal' person – in China has obtained a car or a fridge, a low-carbon energy system would already have to be in place. It will take China 20 or 30 years, even at 10 per cent annual growth rates, to get its mode population to that level. This means that the poor cannot move fast enough to really affect the basics of this maths. We know who the main emitters, the 'few per cent', are. Large proportions of those residing in OECD countries. Anyone who gets on a plane once a year. Most academics. In the UK anyone earning towards £30,000 pounds, or perhaps less than that, would be within the 'few per cent'.

The question is: Are we, the wealthy 'few per cent' – principally, the Annex 1 countries of the world (but also about 200-300 million Chinese are, for example, in the same group) – sufficiently concerned to pass the necessary legislation and make substantial personal sacrifices and changes to our lifestyles now in order to help the rest of the population and future generations? Since we know who needs to change, policies must be aimed specifically at these people. This requires vast political mobilisation, but it also offers hope. There need to be policies tailored to reduce the emissions of the 1 per cent, 2 per cent – or even 10 per cent – who are emitting significantly and disproportionately, rather than universal approaches that impact all 7 billion of the population – 80 to 90 per cent of whom are already very low emitters.

Technology

Some of the necessary policies need to deal with technological change. There are many examples of what could be done.

Consider the electricity system. To light a traditional light bulb in a fossil fuel-driven electricity system, one needs a transmission network with pylons and wires as a way to deliver the power, a power station to generate the electricity, and people in Columbia or Australia to dig out the coal, or workers in Russia to extract the gas from the ground. Then, the fuels must be exported all the way to the power stations. This means that the energy we need for the light bulb requires much more energy

at the source. A normal incandescent light bulb, which is in itself fairly inefficient, will need about 50 units of energy to produce a desired 10 units. About 6–8 per cent of the energy will be lost in transmission and distribution, the power station will be running at somewhere between 35 and 45 per cent efficiency, and there will be about 10 per cent loss in getting the fuel out of the ground, transporting it on a train, taking it to a port, bringing it across the sea, putting it onto another train and delivering it to the power station. All this needs to be done every day of the week for the 40-year life span of the power station. This demonstrates there are huge demand-side opportunities across almost all consumer goods, from cars to refrigerators.

Demand-side opportunities dwarf supply-side opportunities, and we can change demand in the very short term. Toasters have a one-to-two year life span, cars only about eight years in reality. Refrigerators and white goods about three-to-eight years. Real change could be brought about very rapidly through a stringent regulatory framework setting minimum standards.

Consider car efficiency. The average car in the UK emits about 175 g of CO₂ per kilometre. A new car emits on average about 144 g/km. In 2015, the EU plans to introduce legislation requiring 130 g/km as a fleet average (SMMT, 2011). This means the wealthy will be able to drive highly emitting prestige cars as long as the car manufacturers also sell some more efficient cars. In 2008, however, BMW introduced a 3-series 160 horsepower diesel engine. It is a strong, sporty car with a sophisticated diesel engine, but it only emits 109 g/km. Less exclusive cars such as VWs and Skodas were already available with 85–99 g/km. In 1998 Audi had a diesel car that only emitted 75 g/km. It could still travel faster than the motorway speed limits and it did everything a normal car does. With 80–90 per cent of all the vehicle kilometres in the UK (and similar across the EU) covered by cars eight years or younger, existing standard diesel engine technology, tweaked for performance in terms of efficiency rather than in terms of speed, could deliver a 50 per cent reduction of emissions from cars by the early 2020s, assuming the overall distance driven remains unchanged (it is currently stable in the UK). On top of this we could add new technologies, such as hybrids and electric cars. If we then reverse the recent trends in occupancy and have more people travelling together, we could probably see something like a 70 per cent reduction in emissions from cars by early next decade.

What is remarkable about this example is that it does not factor in a big shift to public transport (which is an essential part of the solution); we could still drive as much as we do today. Nor does it factor in a switch to electric cars, which would help the situation even more. It simply

means decent legislation driving the penetration of existing technologies. There is huge potential, whether for cars or refrigerators, across the board, to make radical adjustments with appropriate legislation to bring emissions down in line with what is necessary.

In this sense, there is cause for optimism. Yet we need to bear in mind the reality of current emission projections. If we are broadly right on the science on cumulative emissions and temperature, if the developing parts of the world can peak emissions by 2025 to 2030, if there are rapid reductions in emissions from deforestation, if we can halve emissions from food production (currently they are going up, not down), if we do not trigger discontinuities (or ‘tipping points’), and if we achieve the reduction rates that the Stern report, the Committee on Climate Change and the International Energy Agency maintain are compatible with economic growth – if all of this happens, a 2°C stabilisation is still unlikely. We need to go beyond this.

The current political and economic framework, however, seems to make this impossible. But, it is not *absolutely* impossible. If the ‘few per cent’ of the population responsible for the bulk of global emissions are prepared to make the necessary changes in behavioural and consumption patterns, coupled with the technical adjustments we can make now and the implementation of new technologies (such as low carbon energy supplies), there is still an outside possibility of keeping to 2°C. This is a very positive message. We have the agency to avoid the worst excesses of climate change if we are prepared to make changes now. If we are not, we are heading towards 4°C or more, which could happen as early as 2050. At the end of 2011, the International Energy Agency concluded that there could be 3.5°C warming even by 2035 (IEA, 2011). We are no longer talking about the end of the century, but about the lifetime of most people on the planet today. And again, 4°C is unlikely to represent a stable condition, and global warming may in fact reach much higher levels.

Where, then, does this leave us? In 2005, Tyndall Centre colleagues and I coined an expression that we judged provided a responsible framing of the climate challenge: ‘*To mitigate for 2°C and to plan for 4°C*’. But, as my colleague Alice Bows recently observed, we are in effect doing the opposite: mitigating for 4°C (by doing almost nothing to reduce emissions), while only preparing for 2°C. This is the worst kind of scenario. Benevolent rhetoric aside, we are racing headlong and consciously toward a dire future; where the first to be impacted will be those who have played no part in causing it.

As I have sought to emphasise, this analysis should not be taken as a message of futility. It is intended as a wake-up call, as we have lulled ourselves

to sleep, still wearing our rose-tinted spectacles. Real hope, if it is to rise at all, will do so from an honest assessment of the scale of the challenge. It is, admittedly, very uncomfortable: the numbers are brutal and the hope is tenuous – but it still exists. Brazilian philosopher and politician Robert Unger captured the essence of our challenge when he observed: ‘At every level the greatest obstacle to transforming the world is that we lack the clarity and the imagination that it could be different.’

The one thing we know about the future with climate change is that it will be different. If we do nothing, we will be hit by devastating impacts and unmanageable adaptation needs. If we choose to mitigate to avoid the worst, the mitigation will have to be very significant. The future is almost beyond what we can imagine, what we have ever seen before. Therefore, our role now is to think differently, to achieve greater clarity, to foster a greater imagination and to no longer keep saying that it is impossible. We must make the impossible possible.

There is real hope, but that hope reduces significantly each day.

The one thing we know about the future with climate change is that it will be different. If we do nothing, we will be hit by devastating impacts and unmanageable adaptation needs. If we choose to mitigate to avoid the worst, the mitigation will have to be very significant.



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Climate debt – A primer

Matthew Stilwell

The following climate debt primer was written in the lead-up to Copenhagen as a background note for civil society and governments. It represents an initial attempt to formulate the concept of climate debt in terms of the historic emissions that have polluted 'atmospheric space' and caused climate change (an "emissions debt") and the adverse effect these emissions are causing (an 'adaptation debt').

Climate debt has been reflected in negotiating texts at the UN climate negotiations by Latin American, African and least developed countries. The primer formed the basis of a joint civil society statement in 2009, signed by 240 organisations from all continents, calling for repayment of climate debt as the basis of a fair and ambitious outcome at the Copenhagen COP15, and climate debt has remained a major element of civil society campaigns, statements and submissions on climate justice. Climate debt was widely championed by Bolivia and reflected in the outcome of the World People's Summit convened there in April 2010.

The concept has underpinned political demands by civil society and governments, as well as methodologies for equitably sharing the burden of tackling climate change, and concrete proposals in the UN climate negotiations. The primer reflects the development of the concept of climate debt in collaboration with colleagues in several governments and civil society organisations and scientists.



The adverse effects of climate change fall first and foremost on the majority that is poor.

A wealthy minority of the world's countries and corporations is principally responsible for climate change, the adverse effects of which fall first and foremost on the majority that is poor. This basic and undeniable truth forms the foundation of the global climate justice movement.

Climate change threatens the balance of life on Earth and, with it, human communities everywhere. Addressing climate change requires urgent actions by all peoples, rich and poor, and all countries, developed and developing.

But to be effective, our response to climate change must also be fair. Poor countries and communities are unlikely to sit by while a wealthy minority continues to consume an excessive proportion of the Earth's limited atmospheric space. Nor are they likely to ignore the historical responsibility of the wealthy for the causes and consequences of climate change. Nor should they.

Responsibilities of the rich

Atmospheric concentrations of greenhouse gases are higher today than they have been at any time in millennia. Emitted since the industrial revolution, they have built up in the atmosphere, blanketing the Earth

and causing considerable warming (IPCC, 2007). Responsibility for these emissions lies principally with the wealthy in developed countries. With less than one-quarter of the world's population, these countries have grown rich while emitting more than two-thirds of historic carbon emissions from industrial sources into an atmosphere shared with all life on Earth.

Problems of the poor

The excessive emissions of the wealthy have destabilised the climate, harming the poor and threatening our future. Already, climate change is causing the oceans to rise and acidify; melting ice caps, glaciers and permafrost; damaging forests, coral reefs and other ecosystems; and intensifying fires, floods, droughts and other extreme weather events. It is increasing water stress, hindering the production of food, altering disease vectors and threatening the infrastructure and resources that are the lifeblood of millions of people. Poor countries and communities that have done least to cause climate change suffer first and worst from its adverse effects.

The concept of climate debt

For their disproportionate contribution to the causes of climate change and its adverse effects, the wealthy owe a twofold climate debt:

- » For over-using and substantially diminishing the Earth's capacity to absorb greenhouse gases – denying that capacity to the developing countries that most need it in the course of their development – the developed countries have run up an 'emissions debt'.
- » For the adverse effects of these excessive emissions – contributing to the escalating losses, damages and lost development opportunities facing developing countries – the developed countries have run up an 'adaptation debt'.

The sum of these debts – emissions debt and adaptation debt – constitutes the 'climate debt' of developed countries.

Emissions debt

The extent of developed countries' emissions debt reflects their excessive past, present and proposed use of shared atmospheric space. With less than 20 per cent of the population, developed countries have produced more than 70 per cent of historical emissions since 1850 (Figure 1), far more than their fair share based on equal per-person emissions (Figure 2).

After diminishing the Earth's atmospheric space – denying it to poor countries and communities – the same rich countries now propose consuming a disproportionate share of the remaining space until 2050 (Figure 3) as compared to an equal per capita share (Figure 4).



Figure 1. Actual historical emissions

Figure 2. Equal individual shares (past)



Figure 3. Future emissions proposed by rich countries

Figure 4. Equal individual shares (future)

Developed countries representing a minority of people have appropriated the major part of a shared global resource for their own use – a resource that belongs to all and should be fairly shared with the majority of people.

By basing their future ‘assigned amounts’ on their past excessive emissions levels, they are effectively proposing to write-off the full amount of their historical emissions debt (Figures 1 and 2), and to simultaneously appropriate what their economists value as trillions of dollars¹ of remaining atmospheric space that should rightfully be allocated to the South (Figures 3 and 4).

Their proposals, if adopted, would lock developing countries into low and rapidly decreasing per capita shares, denying them the atmospheric space and finance needed to build the houses, schools, roads and infrastructure the developed world already has.² Their proposals would deepen the debt

1 Stern,(2009) states that the negotiation of emission rights ‘involve[s] substantial financial allocations: at \$40 per tonne CO₂, a total world allocation of rights of, say, 30Gt (roughly the required flows in 2030) would be worth 1.2 trillion per annum’ (p.154).

2 Under EU proposals for a proposed reduction by Annex I countries of 30 per cent from 1990 levels by 2050 and a 15-30 per cent deviation by non-Annex I countries from so-called ‘business as usual’ emissions, the US would continue polluting at around 14 tonnes per person in 2020 and India would be locked in at around 3 tonnes per person. Transfers of technology and financing may alleviate some of the burden of such an unjust allocation of atmospheric space by improving efficiency, but the burden of demonstrating this is possible should remain with developed countries.

of developed countries rather than honouring it, leveraging past injustices into a future climate regime and proposing a system in which the ‘polluter profits’ and the ‘poor pay’ for the excessive historical and current consumption by rich countries.

Adaptation debt

As well as freeing up atmospheric space, developed countries must accept responsibility for the adverse effects of their historical and continuing high per-person emissions on poor communities and countries. Among the hardest hit are:

- » Farmers and farming communities. In some countries, rainfed agriculture is expected to drop by up to 50 per cent by 2020, leaving millions of people without food.
- » Indigenous and local communities. Indigenous and local communities worldwide are harmed by changing ecosystems and threats to their traditional livelihoods.
- » Women. Seventy per cent of the world’s poor are women. Women provide half the world’s food. They are the hardest hit by climate change and must be at the heart of any solution.
- » Poor communities. At particular risk are those communities concentrated in high-risk areas, such as coastal and river floodplains, or areas prone to extreme weather events.
- » People relying on scarce water resources. Between 75 and 250 million people are likely to face increased water stress by 2020 due to climate change.
- » Communities susceptible to health impacts. The health of millions of people will likely be affected through increased malnutrition, increased disease burden and death and injury due to extreme weather events.

These impacts are caused by the historical emissions that have led to current levels of warming, and that will lead to considerable future ‘committed’ warming as the Earth’s oceans and other systems warm. The very existence of some countries is threatened, while others face serious impediments to their efforts to lift billions of people out of poverty and to promote development.

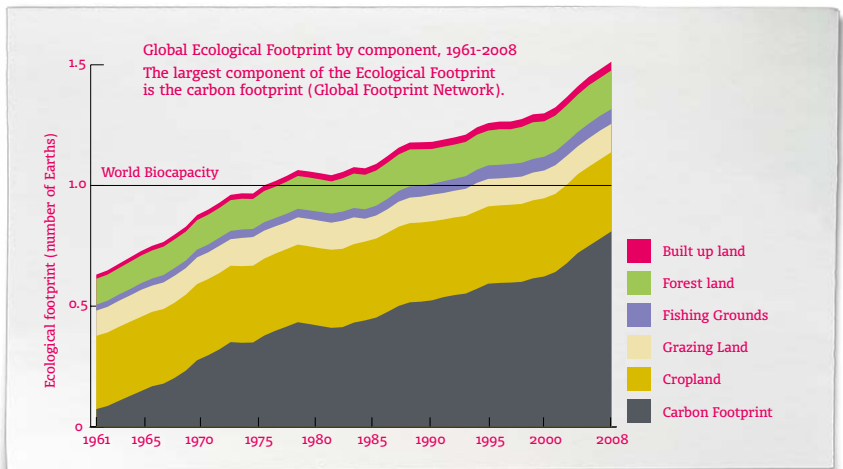
There is no way to predict the full extent of future adverse impacts and costs – emission pathways are uncertain and the climate system is too complex. However, any just approach to climate change must ensure that those who have benefited in the course of causing climate change compensate the victims of climate change. They should cover the full costs of avoiding

adverse impacts and provide compensation for those harms that cannot be avoided. This constitutes their adaptation debt to developing countries and communities.

Climate debt as a component of ecological debt

Climate debt is a component of a larger ecological debt, reflecting the excessive pollution and over-use by the wealthy of the goods and services provided by nature (see Figure 5). As in the case of climate change, over-consumption of food, water, minerals, forests, fisheries and other goods by a minority is contributing to excessive use of limited resources. In the US, the ecological impact per person (measured as the productive land and sea required to provide resources and to absorb wastes) is more than four times the globally sustainable level, more than four times China's and more than nine times India's (WWF, 2008).

Figure 5: Global Ecological Footprints
 Source: Global Footprint Network (2012)



Globally, our ecological impact exceeds the Earth's capacity to regenerate by about 50 per cent (WWF, 2012). If present trends continue, by the mid-2030s we will require the equivalent of two planets. Of this ecological impact, our carbon emissions forms a large and growing part. As a consequence, any effort to advance the cause of climate justice must be rooted in a broader effort to promote ecological and social justice between rich and poor, developed and developing countries.

Repaying climate debt

Developed countries must take responsibility for repaying the full measure of their climate debt. Doing so is not merely right, it also provides the basis of an effective climate solution. A fair and effective climate solution requires at a minimum that:

- » Developed countries repay the full measure of their adaptation debt to the developing countries and communities that did little to cause climate change and are its first victims. They must provide financing and technology to ensure full compensation for losses suffered, and the means to avoid or minimise future impacts where possible. They should commit to repay fully their adaptation debt to developing countries, commencing immediately.
- » Developed countries must repay the full measure of their emissions debt to developing countries and communities. Their assigned amounts of atmospheric space in any future year should reflect this debt (and thus be negative).³ To avoid deepening their debt, developed countries must seek to become carbon neutral (and ultimately carbon negative). There will be no sustainable climate solution if developed countries seek to continue polluting at 70 per cent or more of their 1990 levels all the way through until 2020 (consistent with 30 per cent cuts). They must rather take a lead in cutting emissions through deep domestic reductions, and by accepting assigned amounts that reflect the full extent of their historical emissions debt.
- » Developed countries must provide the financing and technology required by developing countries to live under the twin constraints of a more hostile climate and restricted atmospheric space. They must honour their obligation to provide the full incremental costs of emission reductions undertaken in developing countries, so that these countries can help to mitigate climate change, while still meeting the needs and aspirations of their people.

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³ Stern (2009): 'if the allocation of rights to emit in any given year took greater account both of history and of equity in stocks rather than in flows, then rich countries would have rights to emit which were lower than 2 tonnes per capita (possibly even negative)' (p. 154).

The North-South divide, equity and development – The need for trust-building for emergency mobilisation

Sivan Kartha, Tom Athanasiou and Paul Baer

The impasse in the climate negotiations runs very deep, and is ultimately rooted in the nature and limits of the current development model. That said, there is a great deal that could be done to build momentum and prepare for the global emergency mobilisation that is needed. Up to this point, however, conflicts and tensions between the ‘North’ and the ‘South’ have held the negotiations in virtual stasis. These conflicts are longstanding, and will not be easily resolved. However, as the seriousness of the climate crisis becomes ever more obvious, it becomes equally obvious that a breakthrough is needed, that trust and cooperation are more important than ever.

Given the need to drive global carbon emissions to almost zero in a very short period of time, a number of pressing questions must be addressed. How should the remaining, shrinking, ‘atmospheric space’ – or ‘carbon budget’ – be divided among the world’s nations? How should the rich/poor divides between and within nations be taken into account as this is done? How should obligations be defined, and how can critical social and economic needs like poverty alleviation be taken into account when they are? In short, how ought the contested notions of equity and development be construed and what is their relevance for global climate politics?

These are not academic questions. At a time of mounting pressure to redefine the distinctions between ‘developed’ and ‘developing’ countries, the North seems to be either unable or unwilling to pursue this redefinition in a manner based on equity – or ‘equitable access to sustainable development’ in the delicately negotiated words of the Cancun

This article draws on previous work, notably “Discourses of the South” in the *Oxford Handbook of Climate Change and Society* (Kartha, 2011) and, *The Greenhouse Development Rights Framework: The right to development in a climate constrained world* (Baer et al., 2008).



UN Photo / Ky Chung

As the seriousness of the climate crisis becomes ever more obvious, it becomes equally obvious that a breakthrough is needed, that trust and cooperation are more important than ever.

Agreements – one that would build trust and cooperation as stepping stones to a viable global regime. In this context, the old conflicts are unlikely to be left behind, and we're unlikely to find paths forward to the robust global cooperation that's necessary to drive an ambitious global transition.

This article discusses the North-South divide in climate politics, and how it affects the prospects for real and sufficient climate mobilisation. In particular, it discusses the abiding distrust that characterises the global climate discourse, and the deep resentment that both governments and civil society in the South feel towards the stances and behaviours of the Annex 1 countries. It also discusses the nature of equity in the climate regime, comments on equity as a gateway to increased ambition, presents an instructive, equity-based effort-sharing framework and, finally, offers a brief discussion of possible pathways forward.

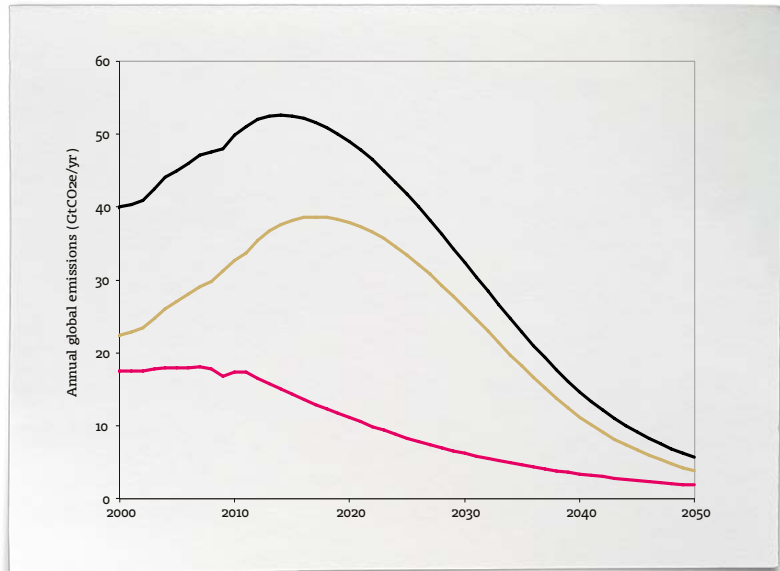
The right to development

Firmly embedded in Southern perspectives on the climate challenge is 'the right to development'. Indeed, if it can be said that the many Southern climate discourses share a core tenet, this would be it.

In both the North and the South, it is understood that climate disruption, if left unmitigated, is a challenge to fulfilment of the right to development. In the South, however, action against climate change is also felt to be a danger to this right. In many ways, it is this latter danger that is the more keenly felt.

Consider the following figure, which shows graphically the stark predicament facing the South. The figure shows a global emission pathway (black line) consistent with a reasonable probability of keeping warming below 2°C. (It assumes a budget of about 1,700 billion tonnes of carbon dioxide equivalent (GtCO₂e) for the first half of the 21st century, which still carries an unsettlingly high one-in-four chance that warming will exceed 2°C.) It also shows an Annex 1 emission pathway (red), with the Annex 1 countries undertaking ambitious mitigation actions, sufficient to drive emissions down by 40 per cent by 2020 and 90 per cent by 2050 (relative to 1990 emission levels). Having stipulated a global trajectory and an Annex 1 trajectory, simple subtraction reveals the carbon budget (shown in yellow) that would remain to support the South's development. Despite the apparent stringency of the Annex 1 trajectory, the atmospheric space remaining for developing countries would be alarmingly small. Developing country emissions would have to peak only a few years later than those in the North – still before 2020 – and then decline by nearly 90 per cent by 2050. And this would have to take

Figure 1: The South's dilemma. The black line shows a 2°C emergency pathway, in which global greenhouse gas emissions peak by 2015 and fall to about 90 per cent below current levels by 2050. The red line shows Annex 1 emissions declining to 90 per cent below 1990 levels in 2050. The yellow line shows, by subtraction, the emissions space that would remain for the developing countries. Obviously, a later peaking year means steeper subsequent reductions and lower emissions levels by 2050 in order to stay within the same carbon budget and thus the same probability of keeping within 2°C.



place while most of the South's citizens are still struggling to maintain or improve their livelihoods and raise their material living standards.

It's precisely this last point – one that's very poorly appreciated in the North – that animates Southern concerns about equity in the climate regime. The brutal bottom line here is that 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. Indeed, in the absence of climate constraints, the South's citizens would quite naturally seek to increase the use of conventional energy resources to fuel the expansion of their infrastructure and the improvement of the material well-being of their citizens. As numerous studies and reports underscore over and over again, access to energy services is fundamental to the fulfilment of any development goals.¹

None of this is to suggest that Southern discourses of 'development' are not fraught. Quite the contrary – the South, like the North, is dominated by proponents of the view that development is more or less equivalent to macroeconomic growth and material consumption (these include most states, and the political and economic elites with whom they are generally aligned). All else being equal, they would be altogether content if the South were to follow a development path that mirrored the North's. But, obviously, there also exist many different, alternative voices and views of 'development'. These range from indigenous and other grassroots movements to urban citizens to intellectuals

¹ See for example UNDP/WHO (2009).



It is difficult if not impossible to identify a vision in which lives improve significantly, especially for the impoverished majorities, that does not entail dramatic expansion of access to energy services.

who raise issues of distributive justice and critique the fixation on development-as-usual to the exclusion of broader and more sustainable approaches to well-being and empowerment. Many assert that just and sustainable development is entirely inconsistent with capitalism and the current economic order, and that a *completely different* understanding of ‘development’ is needed (People’s Agreement, 2010). Nevertheless, and notwithstanding these different conceptions of ‘development’, it is difficult if not impossible to identify a vision in which lives improve significantly, especially for the impoverished majorities, that does not entail dramatic expansion of access to energy services.

Given all this, it is not at all surprising that, while the people of the South are deeply concerned about climate disruption, they are also profoundly worried about the imposition of an unfair climate regime that unfairly hobbles their development prospects.

The bottom line here, one that cannot be overstated, is that in the South, climate action can never be divorced from the problem of development. Nor is this in any way surprising. The development crisis is not merely a challenge but an intractable crisis, badly in need of greater resources and political attention. To make matters worse, the impacts of climate change are now disproportionately and directly affecting the world’s poor, not as some abstract future threat, but as a tangible force undermining food security, water security and livelihoods. The climate-related cataclysms of the last few years have, moreover, made this entirely obvious. And as the political atmosphere of the post-financial-crisis world has settled into extremely worrying patterns, with conflict for markets and resources taking clear priority over underfunded initiatives for Millennium Development Goals, the South has little reason to assume that the North would not willingly allow the exigencies of the climate crisis to eclipse the poverty crisis.

Thankfully, the conflict between climate protection and the right to development is not irreconcilable. After all, clean energy alternatives do exist – but the point here is that they still, for the most part, exist only as potentialities, as ‘alternatives’ that haven’t been seriously pursued. The North has not led the world in developing them, and instead continues to lead the world in pursuing measures that inhibit their development and further entrench conventional options (through, for example, subsidies to fossil fuel exploitation). It’s not surprising that the South is rushing headlong into a fossil future. The alternatives are simply not yet available at scale, and are often too costly for the poor.

With respect to the negotiations and the politics surrounding them, the key point is that sustainable development is not merely an ethical priority. It is also, fundamentally, a non-negotiable foundation of greenhouse-age geopolitical realism. Unless the global climate deal explicitly preserves viable development paths for the countries that were left behind during the great fossil expansion, they may quite justifiably conclude that they have more to lose than to gain from any truly robust engagement with a global climate regime that, after all, must significantly curtail access to the energy sources and technologies that historically enabled those in the industrialised world to realise their development.

Equality in access to the global commons

A second persistent element of Southern discourses is, not surprisingly, equality. It has been framed in various ways, perhaps none more influential than the seminal (1990) publication by Anil Agarwal and Sunita Narain, *Global Warming in an Unequal World*, which pioneered the argument for equal per-capita emission rights. The global climate system is, after all, a public commons, as is the atmosphere into which our emissions flow. The privilege of using the finite atmospheric commons, they argued, must be shared equally among all people.

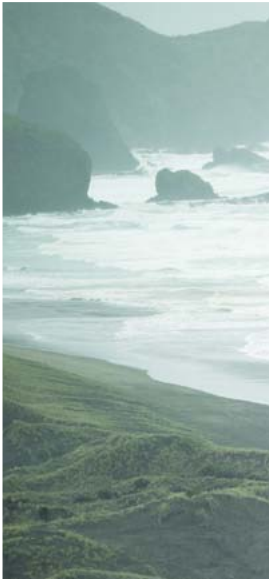
One can measure the atmospheric commons in terms of its total capacity, over time, to absorb our carbon dioxide emissions – starting from the dawn of the industrial age (say 1850, when fossil fuel burning began in earnest) and ending in, say, the mid-21st century (by which time the fossil era must be essentially ending). Based on a path that maintains a reasonable chance of holding the warming below 2°C (the same path used in Figure 1), the total available global emissions budget, over this entire period, provides for somewhat less than 2,700 gigatonnes of fossil-fuel carbon dioxide (GtCO₂). When Agarwal and Narain made their argument back in 1991, less than one-third of the atmospheric commons had already been appropriated. As two-thirds remained, they could, and did, propose that equally shared access to the remaining space could reasonably be advocated as a fair enough way to share the overall atmospheric commons.

Over the intervening years, the depletion of the atmospheric commons has not slowed, as Agarwal and Narain had optimistically proposed; rather, it has accelerated. It took nearly 150 years to consume less than one-third of the atmospheric commons, but the next third will have been consumed in barely 30 years. If these past two decades had been spent weaning our societies off fossil fuels, all would be different. But they were not. We remain as dependent on fossil fuels as we were when Agarwal and Narain wrote their seminal piece advocating equal access to the atmospheric commons. Yet, Annex 1 per capita emissions remain more than twice

Today, the need for target concentrations below 350 ppm is increasingly cited by scientists, Parties to the UN Framework Convention on Climate Change, and civil society.

non-Annex 1 emissions. Moreover, the urgency of the climate problem has become only more firmly supported by the scientific evidence, suggesting that the overall carbon budget is smaller than was hoped. It was thought until recently that climate protection could be achieved by stabilising temperatures at 2°C and atmospheric carbon dioxide concentrations in the 450–500 ppm range (see, for example, Stern, 2006). Now, we realise that we have already imposed ‘dangerous anthropogenic interference with the climate system’, and that we must keep further warming as low as possible. Today, the need for target concentrations below 350 ppm is increasingly cited by scientists (Hansen, 2008; Pachauri, 2009), Parties to the UN Framework Convention on Climate Change (UNFCCC) (AOSIS/LDCs, 2009), and civil society (350.org, WCC, 2009). It’s not only that we’re consuming the remaining atmospheric space, it’s that our previous estimates of its size were over-optimistic.

For these reasons, many in the South are now arguing that Agarwal and Narain’s notion of equality is no longer fair enough. In its place has arisen the notion that equality means an equal sharing of the *entire cumulative atmospheric commons*, both the remaining portion (as Agarwal and Narain proposed) and the portion that has already been consumed. Such an approach, of course, draws attention to past and ongoing over-consumption of the industrialised nations. From this vantage point, the North has consumed atmospheric space at a per-capita level that is 10 times greater than that in the South, and has thus accrued a large and still growing ‘carbon debt’. (See the further discussion of carbon debt by Matthew Stilwell in this volume.)



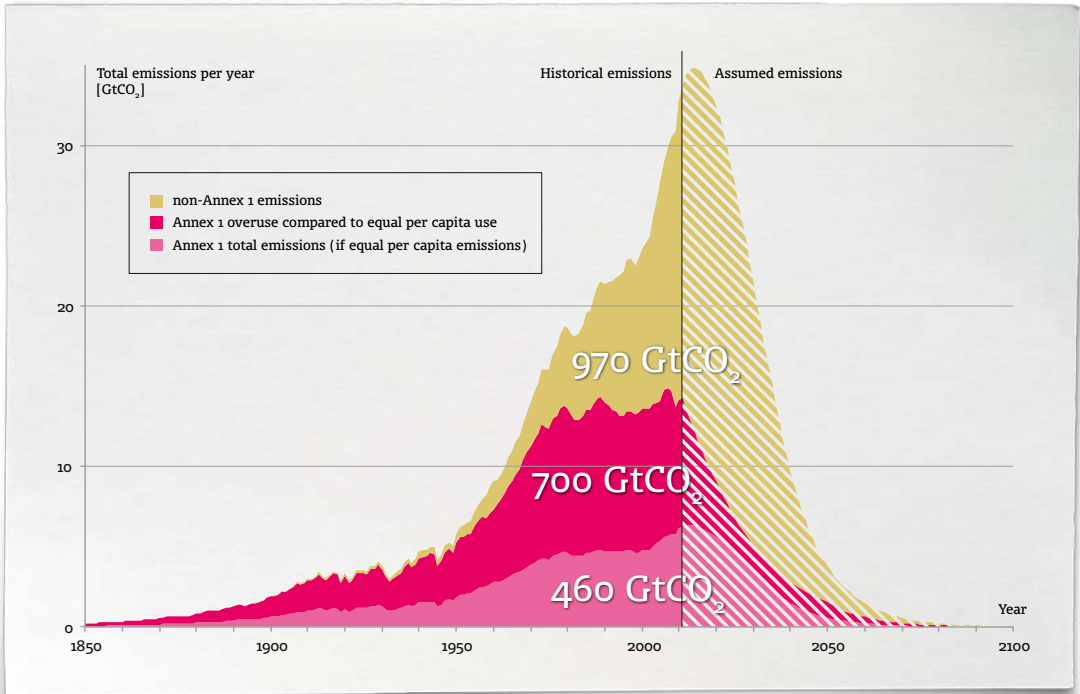


Figure 2 shows Annex 1 overuse of atmospheric space (red area) up to the present day and into the future compared to an equal per capita sharing of the global carbon budget. Even under ambitious Northern emissions cuts (40 per cent by 2020 and 90 per cent by 2050), large enough to leave the majority of the remaining emission budget to the South, total Northern overuse continues to accumulate all the way to 2050.²

Figure 2 illustrates the extent of this overuse. Assuming the same rapid reduction in emissions shown in Figure 1, the pink area in Figure 2 shows what the North would have emitted if, throughout the 250-year period shown, it had kept within its equal per-capita share of global emissions. In actual fact, the North has over time emitted far more than its per-capita share, as is shown here by the pink area plus the red area. Conversely, the South’s actual emissions (the yellow area) are much smaller than they would be with equal per-capita shares (the yellow area plus the red area). The red area thus shows us how much of the atmospheric commons the North has taken – and would continue to take – from the South in a world where each resident had an equal share of the global budget (about 700 GtCO₂e). It is a significant amount – Northern excess consumption is more than two-thirds of total Southern consumption. And this is all true even though there is only one resident of the North for every five in the South.

2 Figure 2 historical emissions are compiled from data from the Carbon Dioxide Information Analysis Center (CDIAC, 2009) of the US Department of Energy, which compiles for all nations’ emissions of CO₂ from all fossil fuel combustion, as well as cement production and natural gas flaring, which together comprise the majority of greenhouse gas emissions. If CO₂ from land-use change and non-CO₂ gases are included (as they are in Figure 1), the budget is correspondingly larger. The emissions budget here is defined to be consistent with the official position of the AOSIS Ministers, which calls for a peak in global emissions by 2015 and reductions of more than 85% by 2050 (relative to 1990 emission levels). The calculation of areas with equal per capita shares (pink for Annex 1 countries and red + yellow for Non-annex 1 countries) is based on the relative share of global population in each year, which varies over the 250-year span.

It is for this reason, ultimately, that the UNFCCC acknowledges the historic emissions of the developed countries, and that Southern climate diplomats and civil society have drawn so much attention to the responsibility that they have thus accrued. Which is not to say that the North should now hasten to deploy massive geoengineering schemes to extract all its excess carbon dioxide back from the atmosphere. Nor is it simply to demand reparations for a historical injustice, which would only further entrench North-South antagonisms. The intent of the attention, rather, is to underscore the foundational reality of the current situation: the North has gained its wealth by depleting a common resource that is therefore no longer available to others. And, critically, a proper accounting of historical emissions provides a further justification for, and perhaps a means of quantifying,³ the North's obligation to provide the technological and financial resources that the South needs to survive and develop within the limited remaining atmospheric space. The salient point is that, by developing as if in an open world, the wealthy gained the financial and technological wherewithal to drive the entire global energy transition.

An effort-sharing approach: Greenhouse Development Rights

Keeping the imperatives of the 'right to development' and 'equal access to the global commons' in mind, what could a fair and yet stringent future international climate regime look like? The establishment of a principled, transparent framework for determining different countries' fair share represents an obvious and critical challenge to the global effort to address climate change.

In the lead-up to the Copenhagen climate summit, we as a small group of researchers⁴ developed the Greenhouse Development Rights (GDRs) framework. The framework, which gained considerable attention and traction around the Copenhagen summit, presents one possible 'effort-sharing' approach in which *responsibility* (in terms of emissions) and *capacity* (in terms of ability to afford mitigation and adaptation measures), are defined and quantified in a manner that seeks explicitly to safeguard a right to development and to account for the vast disparities found not only between but also *within* countries. These measures are then used to calculate a country's fair share of the efforts needed to combat climate change.

³ Several analysts have used an equal per capita access to the full atmospheric space as a basis for quantifying obligations under a global climate regime: Bode (2003), Pan (2009), Kanitkar (2010).

⁴ Sivan Kartha and Eric Kemp-Benedict of the Stockholm Environment Institute, and Tom Athanasiou and Paul Baer of the independent think tank EcoEquity.



There needs to be a period of genuine trust-building between North and South, and nothing has yet occurred to suggest we have entered such a period. Trust-building was the biggest task for the Copenhagen summit, and unfortunately it remains so.

While we are not in any way claiming GDRs to be the only interesting *fair-shares reference framework*, its structure and its results may helpfully illuminate the nature of climate equity. This is particularly useful now, given the post-Durban drive by Annex 1 countries to redefine equity in the global climate regime by eliminating the ‘firewall’ between Annex 1 and non-Annex 1 countries. Whatever the motivation for this drive – a genuine desire to make the regime more equitable, a pragmatic attempt to break the negotiating deadlock, a cynical intention to dodge responsibilities and shift more of the climate burden to the South – the GDRs framework can usefully clarify the situation.

While widely discussed, the GDRs framework has not been adopted by the UNFCCC, nor has any other principle-based framework, and this for obvious reasons. It is simply not possible to move into such a principled effort-sharing framework in one step, given the contested global climate politics and lack of trust that continue to dominate the negotiations. Following a summary of the key features of the GDR framework, we will therefore review our arguments about the path to an ambitious and fair effort-sharing framework, be it something akin to GDRs or something entirely different. Essentially, as many have long maintained, there needs to be a period of genuine trust-building between North and South, and nothing has yet occurred to suggest we have entered such a period. Trust-building was the biggest task for the Copenhagen summit, and unfortunately it remains so.

The ‘development threshold’

The GDRs framework is designed to protect the right to sustainable human development, even as it drives rapid global emission reductions. It thus proceeds in the only viable way, by operationalising the official principles of the UNFCCC, 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’. This oft-quoted principle of ‘CBDR’ is itself a reference to the more explicit text of the 1992 Rio Declaration: ‘In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit to sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.’

As a first step, the GDRs framework codifies the right to development by way of a ‘development threshold’ – a level of welfare below which people are not expected to share the costs of the climate transition. This

threshold is emphatically not an ‘extreme poverty’ line, which is typically defined to be so low (US\$1 or US\$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 labour to keep society as a whole within its sharply limited global carbon budget. In any event, they have little responsibility for the climate problem (the approximately 70 per cent of the population that lives below the development threshold is responsible for only about 15 per cent of all cumulative emissions) and little capacity to invest in solving it. People above the threshold, on the other hand, are taken as having realised 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 fraction 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 US\$18 per day per person (PPP adjusted, US\$2010). 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 of 25 per cent above this global poverty line, we do our ‘indicative’ calculations relative to a development threshold of US\$23 per person per day (US\$8,500 per person per year)⁵. 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 (though still rough) definitions of capacity and responsibility follow, and these can then be used to estimate the fraction of the

⁵ Note that these figures are about 13 per cent higher than they were in previous GDRs publications. This is due to conversion to the 2010 base year.

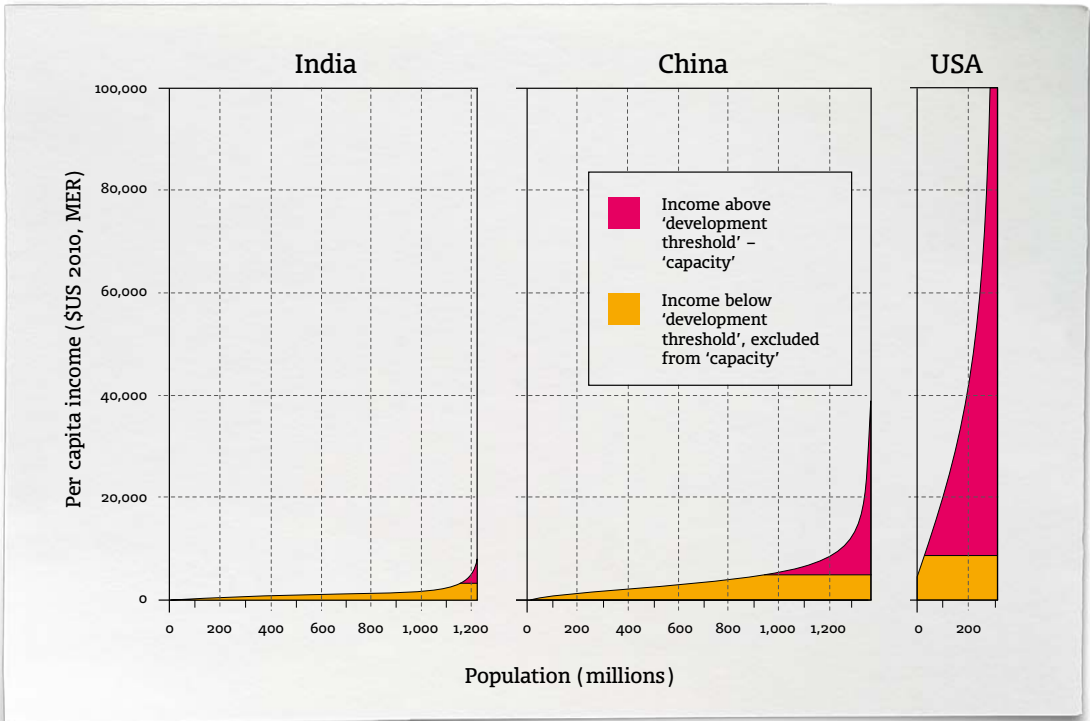


Figure 3: In the GDRs framework, a country's aggregate 'capacity to act' is defined as the sum of all individual incomes, excluding all income below the 'development threshold' (US\$23 per person per day, US\$8500 per person per year in PPP terms). In this figure it is clear that all countries have middle classes and elites with incomes above this threshold (red areas), but the share of total national income that goes to these fractions of the population differs widely between countries. While in the US almost all of the population contributes to national 'capacity' to act, in India only a small proportion of people do so.⁶

global climate burden that should fall to any given country. This is true, moreover, however large that global climate burden may be, and however it is conceived: an obligation to invest in a low-carbon transition, a responsibility to support resilience-building among vulnerable communities, a liability to compensate for climate damages.

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 straightforwardly interpreted as total income, excluding income below the development threshold. This is illustrated in Figure 3, which shows the development threshold (a horizontal line at US\$8,500, PPP adjusted) as it crosses the national income distribution lines and splits their populations into a poorer portion (lightly shaded, to the lower left) and a wealthier portion (darkly shaded, to the upper right). This crossing makes it easy to compare both the heights of wealth and the depths of poverty in different countries,

⁶ Because the development threshold is calculated in Purchasing Power Parity (PPP) dollars rather than Market Exchange Rate (MER) dollars, the adjusted threshold is different in each country. Chart widths are scaled to population, so the capacity areas are correctly sized in relation to each other in terms of MER GDP. These numbers are based on projected 2010 data.

and also graphically conveys each country's capacity (the darkly shaded area), which we define as the income that the wealthier portion of the population has above 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 the 'responsibility start date' (which we default to 1990⁷), excluding emissions that correspond to consumption below the development threshold. Such emissions, like income below the development threshold, 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 need or the actual extent of its wealth. If one looks

7 Our decision to assign the 'responsibility start date' a default value of 1990 does not have the effect of 'writing off' wealthy-world obligations that derive from earlier emissions. Rather, our choice of 1990 reflects our considered belief that obligations rooted in long-past actions are better captured as present-day capacities, which in the GDRs framework are combined with responsibilities to determine overall national obligations.

For example, the emissions that were generated in the US during the 19th century construction of its national railroads are embodied in these railroads themselves (which continue to exist, in improved form) and in the wealth (and thus capacity) that they have generated, and continue to generate. Note that these capacities are present-day phenomena, and thus are not subject to non-trivial objections (e.g. 'people didn't know they were doing anything wrong') that can be levied against responsibility-based calculations that begin far in the past.

The responsibility start date is only one of the key tunable parameters in the GDRs framework. Its default value was carefully chosen, but is certainly not unimpeachable. Other key tunable parameters are the 'development threshold,' and the weighting of capacity relative to responsibility, and the 'emissions embodied in trade' parameter, which in the standard case is set to take the typical production-side view of embodied emissions (assigning China, for example, all responsibility for the emissions embodied in the goods it produces and then exports to Europe) rather than, say, opting for consumption-side accounting (in which the nations that consume China's exports would take responsibility for the emissions that are embodied in them), or some mix of the two approaches. And there are other tunable parameters as well.

In general, we have tried to choose values for the key parameters that seem balanced and ethically justifiable. Still, it's easy to make an ethically credible case for alternative values that would result in larger obligations for wealthy countries, and hard to make such a case for shifting obligations to developing countries. In particular, an earlier historic start date, a lower development threshold, and the weighting of capacity higher than responsibility are all justifiable changes that would increase the obligations of wealthy countries, relative to our standard case. To see the entire set of tunable parameters, and to experiment with alternative settings, see the GDRs "online calculator" at <http://gdrights.org/calculator/>.

only as far as a national average, then the richer, higher-emitting minority lies hidden behind the poorer, lower-emitting majority. Paradoxically, that same 'hidden' richer minority itself obscures the plight of the poor, as its overall significance is magnified by the disproportionate media attention it attracts. Only an objective look at the cold data can sort fact from perception and equitably account for a nation's actual responsibility and capacity.

These measures of capacity and responsibility can then be straightforwardly combined into a single indicator of obligation, in a 'Responsibility Capacity Index' (RCI). This calculation has been done for all Parties to the UNFCCC, based on country-specific income, income distribution and emissions data.⁸ 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 in the default, but a different start date such as 1950 or 1750 can certainly be defended) and, especially, the choice of development threshold. The results are also dynamic, in that they change over time – as the following table shows, the global balance of obligation in 2020, or 2030, can be expected to differ (perhaps significantly) from that which exists today, as some economies grow more rapidly than others.

What's key in all this is that the GDRs framework lays out a straightforward operationalisation of the UN's official differentiation principles, and that it does so in a way that protects the poor from the burdens of climate mobilisation. 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 chosen to be instructive. The 2010 numbers, for example, show that the United States, with its exceptionally large share of the global population of people with incomes above – and generally far above – the US\$8,500 per year development threshold (capacity), as well as the world's largest share of cumulative emissions since 1990 (responsibility), is the nation with the largest share (29 per cent) of the global RCI. The European Union follows, with a 26 per cent share; China, despite being relatively poor, has a 5 per cent global share; India, also large but much poorer, falls far behind China with a mere 0.3 per cent share of the global RCI in 2010.

8 Additional documentation of data sources and calculations are available on the Greenhouse Development Rights website, <http://gdrights.org>.

	Population (% of global)	Income (US\$ MER)	Income (US\$ PPP / capita)	Capacity (% of global)	Respon- sibility (% of global)	RCI (% of global)	RCI (% of global)	RCI (% of global)
	2010					2020	2030	
United States	4.6	45,922	45,922	29.7	29.2	29.4	26.3	21.8
EU 27	7.3	33,040	32,101	30.9	21.2	26.0	22.2	17.6
EU 15	5.8	38,419	35,407	29.1	17.8	23.4	19.9	15.6
EU 12+	1.5	12,122	19,243	1.8	3.4	2.6	2.3	2.1
Japan	1.8	42,985	33,874	10.2	5.0	7.6	6.3	4.7
Russia	2.0	10,543	20,036	2.3	9.4	5.8	5.4	5.0
China	19.6	4,542	7,794	4.8	5.4	5.1	12.2	21.6
India	17.6	1,422	3,454	0.2	0.3	0.3	0.9	2.8
Brazil	2.8	10,684	11,183	2.6	3.1	2.8	2.8	2.7
South Africa	0.7	7,203	10,465	0.4	1.3	0.9	0.9	0.9
High income	15.1	40,317	38,970	81.9	65.5	73.7	65.5	53.9
LDCs	11.4	767	1,585	0.1	0.5	0.3	0.3	0.3
World	100.0	9,088	11,086	100	100	100	100	100

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-income country categories are based on World Bank definitions as of 2010. Projections based on McKinsey and Company (2010) and Sheehan et al. (2008).

As the table above 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 – reflecting its rapid growth and the increasing number of Chinese people who are projected to earn incomes above the development threshold – is likely to quadruple in the two decades from 2010 to 2030 (from 5 per cent in 2010 to 12 per cent in 2020 to 21 per cent in 2030). India would increase its RCI almost tenfold but in absolute terms still only account for 2.8 per cent of the global share in 2030. The RCI of the US and the EU would gradually decrease but still remain very significant at 22 and 18 per cent respectively by 2030.

These figures, again, illustrate the application of the GDRs framework by way of a particular choice of key parameters. Note that also, in this indicative calculation, we have made the rather conservative assumption that all income (and all emissions) above the development threshold count equally towards 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 the RCI to be defined in manner that is more 'progressive' with respect to income. That is, an individual's millionth dollar of income might contribute more to their RCI than their ten-thousandth dollar of income, as is the case with tax schedules virtually worldwide. A more progres-

sive formulation of RCI would shift more of the global obligation to wealthy individuals and wealthy countries.

However, regardless of the particulars of any given quantification, the GDRs framework – or any dynamic 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 objectively and quantitatively to estimate national obligations to bear the efforts of climate protection (adaptation as well as mitigation), to meaningfully compare obligations even between wealthy and developing countries, and to do so even as countries develop and the structure of the global economy evolves, and without being forced to renegotiate the membership of any given ‘Annexes.’ Using the terminology of the Bali Road Map, it would allow us to gauge the ‘comparability of effort’ across countries.

Admittedly, this will be seen as a dangerous idea. It betokens a world beyond the Annex I/non-Annex I divide, in which debates about, say, whether Singapore or South Korea should ‘graduate to Annex I’ would no longer be relevant. Both would simply be countries that, along with all other countries, had obligations of an appropriate scale, as specified by their RCIs. But it is also a liberating idea. It defines and quantifies national obligations in a way that explicitly safeguards a meaningful right to development. It accepts 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 industrialised countries to accept such a regime.

Action, trust-building and differentiation

The GDRs framework, we believe, is enough to give us a sense of destination. Please be clear about this claim. We do not presume that our particular quantitative results – relying as they do on the limited data sets now available, and the assumptions we consider most defensible – are in any sense the last word. But we do argue that a principle-based framework for quantified differentiation is unavoidable, and that such a framework will be needed if we are to avert a protracted series of more or less ad hoc agreements that assign countries semi-arbitrary and inadequate obligations that ultimately fail ever to really get out of the impasse that prevents global emergency mobilisation.

But a sense of the destination is not enough. We also need a way forward. For while ad hoc, tactical incrementalism would be a losing strategy, incrementalism of some sort is unavoidable. The divide between today’s temporising and tomorrow’s mobilisation will not be bridged in a single

step. The climate negotiations problem is, in some essential sense, a sequencing problem. The question, simply put, is what comes next.

What we know is that history follows a complex and varied course. Obligations, capacities and responsibilities cannot be fully captured by any top-down, principle-based scheme such as GDRs, which is ultimately and inevitably ahistorical. Given this, it is no surprise that the analysis above understates the politics that got us to this impasse, and the political accommodations that will be required to get us beyond it. It neglects, in particular, the trust deficit that plagues North-South relations – a deficit so large and deep-rooted that it effectively rules out the simplest and most attractive way forward, in which all countries – in the North and in the South and in between – would straightforwardly commit to carrying their ‘fair share’ of the global climate burden.

But that, again, is only our destination. The question is how the North and the South could together find a way forward, one that builds immediate ambition, momentum and trust, one that opens the doors to global emergency mobilisation before it is too late.

The challenges are daunting on both sides.

How, in the North, could anything like this ever be possible? How, given the madness that has come upon the wealthy countries, one in which ideologues and elites have cast a mythology of ‘debt crisis’ and ‘bitter medicine’ and ‘austerity’ over all claims to the commonwealth, could the North ever accept the necessity of large-scale financial and technological investments in a climate mobilisation, including massive support to the South? How, given the United States’ refusal of ‘top down’ obligations and its insistence on ‘flexibility,’ could any sort of principle- and indicator-driven framework come to guide the negotiations? How, given the North’s fear of a rising Asia, and its stubborn insistence that the South is both unwilling and unable to restrain its own emissions, will the North ever come to see the implacability of the logic – the fear of a foreclosed future – which most deeply animates the South’s negotiators? And how, given that the North’s blindness on these points is an almost perfect, ready-made excuse for its own continued free-riding, can there be any path to rapidly increased global ambition that does not begin in the North?

One brutal truth must be very clearly stated. There is very little reason to believe that the international technological and financial flows of the necessary scale would ever be forthcoming in any regime in which only countries of the North have quantified commitments. The well-off citizens of the North, faced with demanding obligations, will demand



Fossil fuels have driven development to this point, and the countries of the South are not about to sign away their right to follow along this, the only proven, pathway, not without the North's demonstrated willingness to help chart out, and indeed pioneer, an alternative course.

in turn that their well-off Southern counterparts (and they do exist) face parallel, 'fair share' efforts of their own, and they will make such parallelism a condition of their own full participation in any climate stabilisation regime. This is, if not a fact, a hypothesis of such obvious and powerful resonance that it can almost be taken as a fundamental axiom of global climate politics.

Moreover, and critically, the South is – at least at the moment – unlikely to accept such parallelism, even if national obligations are defined in a rigorously principle-based way that genuinely safeguards its right to development. This may change, but at the moment it can be taken as axiomatic that the distrust that pervades the developing world will not easily yield to even the crushing necessities of the climate crisis. For one thing, the South's distrust is not groundless. It is rooted in the North's repeated failure to meet its UNFCCC and Kyoto commitments to provide technological and financial support for both mitigation and adaptation, and beyond these, its protracted history of self-interested and even bad-faith negotiations in all sorts of other multilateral regimes (the trade and intellectual property negotiations come particularly to mind). The South fears, in particular, that if it were to accept its fair share of the climate burden, the North's negotiators would simply and immediately take unfair advantage of its flexibility, holding it hostage to its newly made commitments while continuing to dodge their own. This is simply too big a risk to expect the South's leaders to take easily. Fossil fuels have driven development to this point, and the countries of the South are not about to sign away their right to follow along this, the only proven, pathway, not without the North's demonstrated willingness to help chart out, and indeed pioneer, an alternative course.

A trust-building period

We have little choice but to think in terms of an interim period in which (1) mitigation action is maximised while, simultaneously, (2) the foundation of trust on which broader cooperation can be based is hammered into place. One can call this a 'trust-building' period, though the term should not be taken to imply any further delay in concrete action. So, to be absolutely clear, action and preparation for further action are the only viable foundations for meaningful trust-building, and in any case this transition period should be as short as we can possibly manage.

What the North must do to build trust

The trust we need won't come easily, and both North and South will have to take bold steps before it comes at all. The North, in particular, must demonstrate that it honestly seeks to act, at scale, in a global effort to protect the climate. Under the present circumstances (the US, Europe

and Japan are all in crisis, and the US in particular is besieged by a far-right radicalism that is deliberately, strategically contemptuous of science) this is not going to be easy. Nevertheless, the North's leaders must find ways to demonstrate their readiness to reduce their domestic emissions, and to otherwise 'take the lead'. After having entirely neglected its Rio promise to stabilise emissions at 1990 levels by the year 2000, and after a long decade of temporising and half-efforts in the face of its Kyoto commitments, the North will have to step up its efforts before it can reasonably expect others to do the same. In particular, it must demonstrate a willingness to go well beyond no-regrets abatement measures, and to ramp up mitigation efforts at a rate that will converge rapidly on a genuine emergency emission stabilisation pathway.

Second, international technological and financial support is essential. There's much to be said here, and there are many options, including a variety of 'creative finance' mechanisms from bunker and aviation taxes to financial transactions taxes to subsidy reform. In all these cases, equity is a major issue; in all of them, pragmatism is in order. Again, the citizens of the North must be honest about the scale of the necessary effort. For one thing, the Clean Development Mechanism (CDM) is not even remotely sufficient or appropriate in this regard, and further carries its own fundamental problems. (The CDM is discussed elsewhere in this volume.) Nor will any degree of creativity entirely obviate the need for direct government-to-government transfers. The overall challenge is simply too great. Investments in renewable energy and reducing emissions from deforestation and land degradation, flexibility on climate-related intellectual property rights (IPRs), institutional capacity-building and policy support are all desperately needed. Through such measures, the North must demonstrate – by unambiguous and practical action – that it will in fact support Southern countries as they launch and accelerate their own transitions to low-carbon development, and it must do so in a manner that can be monitored, reported and verified.

Third, the North will have to deliver – and in more than token ways – on its lingering promises from Rio (especially Article 4 of the UNFCCC) to provide developing countries with adaptation funding that is both 'new and additional' and 'predictable and adequate'. The North has almost entirely ignored these commitments – and in some cases actively obstructed their fulfilment – and this has been a source of well-justified bitterness on the part of the South, a bitterness which has only grown as the need for active, ambitiously scaled adaptation efforts has become more evident. If the North fails to start mobilising resources to support the most urgent of the South's adaptation needs, it will be an extremely dark portent, an almost certain sign of failure to come.

Fourth, the North must help to create a more transparent and less procedurally unequal negotiating environment. The South's reluctance to negotiate more proactively – assuming instead the defensive posture of indefinitely waiting for the North to 'take the lead' – is in no small measure due to the fear that, were it to engage seriously, it would then be outmanoeuvred or, even worse, defeated with strong-arm tactics. The priority given to the maintenance of solidarity in the G77/China, despite the obvious divergence of interests, is ample evidence of this fear. Thus, the North must help to launch a new era of good faith negotiations, for example by investing to help the negotiating teams of the South build their analytical and negotiating capacity. And beyond this, Northern negotiators must realise that the US's fixation on ad-hoc, bottom-up models of 'flexibility' is almost sure to provoke mistrust, and they must isolate rather than support the US's efforts in this regard. As we move into the post-Durban negotiations, principle-based approaches to 'objective' indicators of capacity and responsibility will be essential if we are to have any real chance of moving into a new period of global cooperation.

Finally, and as a matter of realism, the North must realise that the South cannot afford to see the climate negotiations in a vacuum. This, actually, is an opportunity – if ever the North genuinely seeks to cut quickly through Southern cynicism, it can always supplement its climate-related overtures with action in linked realms that are traditionally seen as 'non-climate-related'. Long-standing Southern concerns – such as those related to trade barriers and subsidies, or odious foreign debt – would be good places to look for dramatic unilateral measures by which the North could quickly build trust.

What the South must do to build trust

The South, too, must act dramatically to overcome the trust deficit. This is the case not only in affluent Southern countries like Singapore and South Korea, but also, and particularly, in China, which – though suffering a relatively low average per-capita income – nevertheless has, and is known to have, a significant capacity to act. Such countries must act, and be seen to act. Unless they do, no attempt to embark on an international trust-building period can possibly succeed. The question is how they must act, and here we're compelled to say that – at least in the next few years – transparency and comparability will be far more important than legal form.

We say this despite even our own calculations, which suggest that an RCI-based reckoning of the South's obligation is sizable, amounting to perhaps one-quarter of the global total. We do so for the obvious reason that a successful trust-building process simply cannot push legally

binding mitigation commitments onto the non-Annex I countries. The course of the negotiations thus far, and the failure of the North demonstrably to 'take the lead,' has made this a simple fact of life. Indeed, the depth of the North/South impasse – a call to realism if ever there was one – compels us to note that developing countries cannot be legitimately pressured to accept legally-binding targets. Nor is this what is asked of them by the Bali Agreement, which calls only for 'nationally appropriate mitigation actions by developing-country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner'.

Still, for all this, we can reasonably ask most developing countries to put real mitigation measures into effect, and – in countries with significant responsibility and capacity – we can ask that these be of a significant scale. Further, the developing world must demonstrate that it is both willing and able to undertake measuring, reporting and verification (MRV) of the technological and financial support that it receives from the North. The countries of the North, after all, will be both unwilling and unable to commit to major finance and technology transfer to Southern partners, unless they can also demonstrate – to themselves and to their inevitable domestic opponents of such 'giveaways' – that it will be effective. This will entail much more than the minimal sorts of efforts that the South has had to make to host CDM projects. Rather, it will require the South to demonstrate concretely its willingness to engage effectively with MRV support, to move – quickly, comprehensively, efficiently and transparently – to utilise such support effectively, and to scale up this engagement as needed, as early efforts expand into the much more challenging North-South cooperation that will soon be needed.

Second, we believe that trust-building will require some developing countries to act beyond the scope of MRV support. These actions would have to be voluntary, and would focus primarily on identifying and exploiting no-regrets (zero or net-negative cost) options, and on measures that have significant sustainable development co-benefits. But this is not to say that they should not go further, towards additional measures motivated primarily by climate mitigation. Expectations in this regard, however, should be carefully tempered, and must be attuned to each country's responsibility and capacity. And again, such expectations can only be calibrated to the North's own efforts, which will be closely scrutinised by the developing countries and taken as clear markers of the North's seriousness. The critical point is that, while the South's short-term efforts might not measure up to a strict, RCI-derived accounting of its share of the required global obligation, they

might well accomplish a great deal. The South can achieve quite a lot while pursuing its sustainable development objectives, with or without sufficient Northern support.

Finally, the South must demonstrate that it is serious in its oft-professed desire to prioritise poverty eradication and sustainable human development. In this regard, it's important to emphasise that the South's efforts during the trust-building period – no-regrets mitigation, further voluntary mitigation in rough proportion to responsibility and capacity, additional supported mitigation, and of course, a variety of adaptation initiatives – can and should be pursued in a manner that draws no resources whatsoever from citizens living below the development threshold, and indeed benefits them. Which is to say that developing countries can act without compromising any sustainable development priorities, providing only that they're willing to pass on the costs to their consuming classes, rather than their poor. Countries that prove unwilling to do just this cannot expect to be taken seriously, if they subsequently insist that 'development comes first'.

'Comparability of effort'



From here on, and ready or not, countries will be judged not only by the opportunities they offer their citizens, and by the strengths of their democracies, and by the vibrancies of their cultures; they will also be judged by whether they carry their proper share of the global climate burden.

The trust-building period, whatever form it takes, will be tense. During it, both the North and South will have to make more than token efforts to limit their emissions, and both will have to adapt to the rapidly emerging political realities of a climate-constrained world. From here on, and ready or not, countries will be judged not only by the opportunities they offer their citizens, and by the strengths of their democracies, and by the vibrancies of their cultures; they will also be judged by whether they carry their proper share of the global climate burden.

The equity principles by which such judgments can be made are now on the agenda. The UNFCCC's workshop on 'Equitable Access to Sustainable Development', held in Bonn during the May 2012 inter-sessional negotiations, proved this in detailed and quite clear terms.⁹ More particularly, there is now a widespread, extremely watchful expectation that countries contribute in rough accordance with their responsibility and capacity, defined in globally acceptable terms, and there is an increasingly obvious need to measure this 'comparability of effort' in a coherent and transparent manner. After all, weak action on the part of countries that should be taking strong action would be extremely corrosive. It would be seen by all as evidence that the consensus for

⁹ See Tom Athanasiou, 'Global Climate Justice gets its 15 Minutes: The UN workshop on 'Equitable Access to Sustainable Development,' at <http://www.ecoequity.org/2012/06/global-climate-justice-gets-its-15-minutes/> for a detailed discussion of the workshop and a host of related pointers.

a global solution is failing to materialise. As such, it would harden the natural inclination, shared by all countries, to invest in their own short-term interests rather than in the preservation of the global commons. Which is to say that the great shift we now need – from ‘What is in it for us?’ to ‘How can we help?’ – will only be possible in a world where, implicitly or explicitly, the shared background of the negotiations is that fairness is the common goal.

It is not too much to assert that it has become critical to lay the groundwork for a common global understanding of the ‘comparability of effort’ problem.¹⁰ Which is to say that, after years of loose and largely academic debate about fair global effort-sharing frameworks, we must now become serious. In fact, during any meaningful trust-building period, practical ways of understanding, assessing and explaining comparability of effort will have to emerge visibly and publically, and be recognised as foundational elements of the future regime. In particular, framework proposals such as Greenhouse Development Rights, which are based on the UNFCCC’s official equity principles, will have to be developed, deliberated and vetted to the point where they can effectively and legitimately be used as guides to comparability.

We would go so far as to claim that even a rough consensus on principle-based measures of effort (such as the GDRs RCI introduced above), as *reference indicators* that usefully inform the negotiations and civil society, would have to be counted as an important indicator of success. We would also claim that if the negotiations are succeeding, we will know this in part because coherent debate about ‘fair shares’ of the global effort will come into greater prominence, and give credence to explicit quantitative indicators for assessing performance with respect to national ‘fair shares’.

Such assessments will have to be approximate. In particular, they will have to accommodate a variety of types of commitments – some of them softer and more implicit than we might perhaps wish. Among the Annex I countries, of course, commitments should take the clear, unambiguous form of legally binding, quantified emission targets. But for the developing world a considerable amount of flexibility will be needed, certainly in the near term. We’ll have to accept a variety of voluntary efforts – from South Africa’s emission targets, to China’s efficiency targets, to India’s solar production targets – as legitimate contributions towards a common ‘fair shares’ effort. While the accounting challenges posed by the need to

¹⁰ We say ‘global’ with the full knowledge that the Bali Action Plan applies the phrase only to Annex I. We do not intend to imply otherwise, but we must insist that comparability of effort is exactly what is needed, and that we’ll all have to take it much more seriously than we have in the past.

monitor, report and verify such diverse efforts would no doubt be greater than those posed by a regime in which there were similar, legally binding emission targets all around, the final outcome in terms of actual emission reductions could be just as robust. Indeed, it could be far more robust, because unlike the formal, legally binding alternative, a more flexible approach might actually be embraced by the South.

Though flexible in form, developing-country efforts must also reflect some meaningful kind of differentiation within the developing world. Nor would this be an unprecedented step. Such differentiation is already suggested by the Bali Action Plan, in terms such as ‘nationally appropriate’ and ‘in the context of sustainable development’. Note also that it can also be *de facto* rather than *de jure*. As much as some Annex I countries may wish for a strict system in which developing countries graduate into Kyoto-style quantified emission targets, it is not actually necessary.

What is necessary is that differentiation manifests itself in bottom-line reductions that developing countries ultimately achieve via nationally appropriate mitigation actions. Because, ultimately, a key measure of the success of a trust-building period will be whether the efforts of the key developing countries – voluntary though they may be – bear a defensible relationship to their legitimate share of the global effort, and are in rough proportion to their responsibility and capacity.

The key words here are ‘rough proportion’. During the trust-building period, we cannot expect any quantified gauge of effort to be applied with the force of law. At the same time, the actions of the relatively wealthy and high-emitting countries of the South will be watched very closely indeed. If South Korea, Singapore and the United Arab Emirates do not appear to be doing at least as much as – or indeed, more than – the much poorer countries of Annex I, such as Ukraine and Belarus, they would obviously be free-riding. By so doing, they would undermine any claim that ‘the South’ supports a principle-based approach to differentiation as an important ingredient of a robust global effort-sharing agreement. And they would fatally undermine their own claim that the wealthy Annex I countries must finally accept their large but appropriate share of the global obligation to act.

All this has implications. It means, particularly, that the citizens of the North must somehow be brought to understand that the economic division between rich and poor that defines our times has decisive implications for the ultimate prospects of a successful global climate response. In particular, if flexible participation with *de facto* differentiation is to be the vehicle by which the developing countries enter the climate regime,

then this must be understood – across nations and classes and even in the United States – as being just and proper. It is action, and not legal commitments, that matter, and people must learn to make the necessary distinctions. Brave sorts of education campaigns will be essential, campaigns that link climate obligation to development and inequality.

At this point, if any nation from which the global community can reasonably expect resolute action continues to temporise, and if – even within a critical, last-ditch international trust-building period – it still refuses to make good-faith efforts to meet its fair share, then there must be consequences, and even sanctions against it. There is no longer any latitude for denial or apology.



Adopt A Negotiator

The situation is fraught and time is very short. Global emission curves must soon be bent sharply downward and then enter a rapid and sustainable decline.

All of which leaves us with a paradox. We call for ‘emergency mobilisation’ but argue that a ‘trust-building period’ must come first. Is this not a contradiction? We do not believe that it is, for – along with many others – we have concluded that true mobilisation can only begin with a concerted effort to build solidarity and resolve. Still, the situation is fraught and time is very short. The global emission curves must soon be bent sharply downward and then enter a rapid and sustainable decline. Given this, we only have one last chance to get things right. Failure is not an option.

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Bangladesh, July 2009







Part II » The Climate Negotiations

A clash of paradigms – UN climate negotiations at a crossroads

Martin Khor



UN Photo/Evan Schneider

Since the 2007 summit in Bali, the climate talks have been characterised by a clash of perspectives and paradigms

Since the 2007 summit in Bali, the climate talks have been characterised by a clash of perspectives and paradigms, mainly along North-South lines, although there have also been considerable differences among developing countries. Generally, developing countries have stressed the need to base the talks on the equity principle, arguing that developed countries have to take the lead in mitigation by committing to deep emission cuts by 2020, and by providing substantial finance and technology to developing countries (so far there has been little of this since the Convention was born in 1992). Developing countries have seen this as necessary in order to enhance their own climate actions, while pursuing their development priorities.

Developed countries have emphasised the need for developing countries to take serious mitigation action and argued that a category of developing countries (sometimes called advanced developing countries, major economies, or major emitters) should take on binding or almost-binding targets, and that all but the most vulnerable should be subjected to having their actions measured, reported and verified (MRVed) by an international process.

Some developed countries (notably the Europeans) have traditionally also called for a more disciplined, top-down approach to Annex I Parties' mitigation commitments, whereby an aggregate goal of emission reduction for all these countries taken together is agreed upon, based on what the scientific research indicates is needed to limit global temperature rise within safe limits, and each country makes a national commitment comparable to those of the others, which would all add up to the aggregate. This approach is also strongly advocated by the developing countries, and was agreed to as the one to be used when negotiating commitments for the Kyoto Protocol's second period. But it is vehemently opposed by the United States, which is supported by several other countries.

This article builds on articles previously written by the author and published in various magazines including *South Bulletin* and *Economic and Political Weekly (India)*. The latter part also builds on contributions by Meena Raman, Third World Network (2011).

UNFCCC and the Bali Action Plan

The yearly ministerial negotiations among the 193 member countries – the ‘Parties’ – of the UN Framework Convention on Climate Change (UNFCCC), which take place in December, are in fact a combination of several meetings of the Convention and its Kyoto Protocol. The most important of these are the Conference of Parties (COP) of the Convention, the Meeting of the Parties of the Kyoto Protocol (CMP), and, more recently, the sessions of the two *ad hoc* working groups on long-term cooperative action (AWG-LCA) and on the further commitments of Annex I Parties in the Kyoto Protocol (AWG-KP). The AWG-KP was formed in 2005 to negotiate the new emission-reduction goals (to take effect as of 2013) of those developed countries that are Parties to the Kyoto Protocol (all are, except the United States and – recently – Canada, which at the end of 2011 announced its withdrawal from the Protocol). The AWG-LCA was formed at the Bali conference in 2007 to follow up on the Bali Action Plan whose aim is to fully implement the Convention’s objectives.

The Bali conference clearly demarcated that the global climate talks would be maintained under the two tracks of the AWG-LCA and AWG-KP, known together as the Bali Road Map, and that both tracks would complete their work in 2009. This two-track road map has been seen as a keystone by developing countries, as it is intended to ensure legally binding and deep emission cuts by Annex I Parties under the Kyoto Protocol track and a ‘comparable’ mitigation effort by the United States under the Convention’s AWG-LCA track, since it is not a Kyoto Protocol member (which the US was forced to concede to under the very tough, final negotiations in Bali in 2007). In exchange, the developing countries would agree to enhance their mitigation actions, supported by finance and technology transfers, with both the supported actions and the support being subjected to a process of measurement, reporting and verification.

The Copenhagen Conference, which ended in chaos in December 2009, saw the near-triumph of an alternative United States-led approach, in which each developed country would pledge what it could do and a review would be conducted on whether its actions met the pledge. This bottom-up, individual approach is contrary to the top-down, collective approach agreed to in the Kyoto Protocol process.

COP 15 Copenhagen (December 2009)



The Copenhagen Climate Conference failed to deliver... because the presidency of the conference and Western political leaders essentially tried to hijack the legitimate, multilateral process of negotiations.

The Copenhagen Climate Conference failed to deliver, not just because there was no final, complete agreement, not even because there was no 'legally binding' political declaration on which a future agreement could be built, but because the presidency of the conference and Western political leaders essentially tried to hijack the legitimate, multilateral process of negotiations that had been taking place before Copenhagen and during the conference.

The hijack attempt failed and a weak Copenhagen Accord, which a small group managed to come up with from their enclave during the conference, was unable to get through the Conference of Parties, made up of the 193 members of the UN Framework Convention on Climate Change.

It was the intention of the Copenhagen conference chairman – the Danish prime minister, Lars Rasmussen – first to get a small group of leaders to reach an agreement and then to ram it through the Conference of Parties, giving the full membership little time to consider the document. However, decisions at the COP are made by consensus, and objections from several developing countries first to the undemocratic process and second to the content of the Accord meant that the COP only 'took note' of the document, and did not 'adopt' it.

In UN terms, 'taking note' of a document gives it a low status. It means that the meeting did not approve or pass it, and did not view it either positively or negatively.

The non-adoption of a three-page document emanating from a secretive small meeting of some 26 leaders that should not even have taken place should not have spelt disaster. Unfortunately, though, in the immediate aftermath of the conference, it was being projected in the Western media by Western leaders and many commentators that a good deal had been blocked by some developing countries, with some blaming China for its stand in the small meeting and others blaming the countries that spoke up against the process in the COP, such as Venezuela, Bolivia and Sudan.

The reality is that almost everyone knew that a full agreement, or even the core of an agreement, could not be reached in Copenhagen, simply because there were still many fundamental points of disagreement that could not be bridged in time. The climate talks had been following two tracks – the continuation of commitments made under the Kyoto Protocol, for four years; and the Bali Action Plan on long-term cooperative action, for two years.

Those involved in or following the process knew that Copenhagen could not conclude the negotiations in both of the working groups dealing with the issues, and that the talks would have to continue the following year.

It should not have been cause for recrimination, therefore, that the deadline set for end-2009 proved unrealistic and that the talks needed to continue along the same open, inclusive, multilateral lines for another year. Copenhagen should have been designed as a stepping-stone, and not as a conclusion. Unfortunately, the host country Denmark and the UN leadership had the highest ambitions, and called on heads of state and government to come to 'seal the deal', and 110 top leaders duly came. The Danish presidency selected 26 of them and asked them to agree on an accord.

The real outcome of Copenhagen – negotiating texts from the AWG-LCA and AWG-KP

The proper procedure would have been to make use of the two weeks in Copenhagen to close as many of the gaps as possible and then to bring forward the most up-to-date documents arising from the two working groups (with the differing positions on unsettled issues as options or in square brackets) for extended work in the two working groups, and to set a new deadline for completion of the work for either June or December 2010.

For most of the two weeks at Copenhagen in December 2009, the work of the two groups on KP (Kyoto Protocol), and on LCA (long-term cooperative action) had been proceeding under the multilateral process, in an inclusive manner with all Parties able to submit proposals and language for the drafts, and to participate in drafting and in decisions. The meetings were conducted in a broadly transparent manner, being mostly open-ended (open to all members) and when they were in small groups the full membership normally chose their representatives to attend. Most of the thousands of delegates from governments were diligently working on the many texts on the issues of the Bali Action Plan (involving mitigation, adaptation, finance, technology and a shared vision) and on the Kyoto Protocol's continuation.

Of course, being so participatory, the discussions tended to take time. And since the issues are so important and complex, involving not just the science of climate change but also the political economy of sharing the burden of curbing emissions and paying for the costs both of mitigating and of adapting to climate change, the negotiations were inherently difficult. With issues involving massive transformations of national economies and growth strategies, the climate talks became the most complex global negotiations ever, more so than those at the WTO.



Kris Krüg

More than 100 000 people demonstrated peacefully on the streets of Copenhagen. In clashes with police many were arrested.

The G77 and China and its component countries continuously voiced their opinion that the working groups and their documents, painfully put together through the bottom-up process that recognised the rights of member states big or small, should continue to be the basis of the negotiations. They continuously sought assurances from the Danish Presidency that a small group would not hijack the work carried out in the working groups. The Chairs of the working groups produced up-to-date reports containing draft Decisions with texts that in their view represented the latest state of play. These reports went through hours of discussion by thousands of the delegates representing all the members (throughout the two weeks at Copenhagen, meetings often went on way past midnight) and were prepared for adoption by the Convention's COP and by the Kyoto Protocol's meeting of the Parties. They were eventually adopted and ready to be presented to the final 'ministerial segment,' of the meeting, because they had gone through the democratic process, and the members had ownership.

The reports that were adopted should have formed the major reference points when the negotiations resumed the following year. The adoption of these two reports, together with two brief Decisions extending the mandate of the two working groups and setting the new deadlines on conclusion of the work, would have been sufficient. The Danish prime minister could have declared in a closing speech that the issues were complicated, that consensus had been found in some areas, and significant progress had been made in other areas in the last two years, but that more time was needed for a full set of agreements. He could have exhorted everyone to do his or her utmost to complete the work within half a year or a full year. No one should have blamed him for this reflection of reality.

If, on top of this outcome, the Danish Presidency wanted a brief political statement to take into account the presence of the political leaders, it could have logically asked the Chairs of the working group to consult with the delegates and extract the core elements where there was consensus in the approved documents and make it the basis of a separate political statement. The statement could also have reaffirmed the main principles underlying the negotiations, laid out the main challenges ahead, such as the major issues of contention requiring urgent attention, set new deadlines, and reaffirmed the highest political commitment to finishing the work.

Such a declaration, reflecting the reality of the bottom-up negotiating process and its results, could have given a political impetus to the climate talks, based on a spirit of goodwill and international cooperation.



The two processes crashed, with explosive results, at the final official plenary convened at 3 a.m. on 19 December, as the conference was going on overtime.

Collision of two processes

Instead, the organisers of the conference chose to convene the small group of heads of state (who of course did not have a full grasp of all the technical details), hoping that they would produce a consensus on the many key contentious issues where the negotiators could not. But it was a major gamble, as an exclusive meeting would always justifiably be open to criticism for not being legitimate, and for producing as its outcome a document that did not enjoy consensus and was biased. That the meeting itself was taking place in the last two days of the Conference was not announced, nor who had been invited, nor what they were going to produce.

At some stage, the secretive process of the small exclusive meeting would have to collide with the open process of the multilateral Convention members. The two processes crashed, with explosive results, at the final official plenary convened at 3 a.m. on 19 December, as the conference was going on overtime (it was supposed to have ended on 18 December).

When Rasmussen presented the Copenhagen Accord to the Conference of Parties, he was severely criticised by many countries for embarking on an exclusive and illegitimate process that violated the UN Charter, principles and practices. A battle then ensued between those Parties that rejected the Accord, both for the flawed process and its inadequate contents, and those Parties (mainly Western) that insisted that the Accord be adopted even if it did not enjoy consensus.

The Danish prime minister did not distinguish himself for consistency or fairness, first making one ruling and then making a contradictory one, and repeating these overturnings of decisions continuously as the night turned into morning.

When it was clear at the concluding plenary that the Accord would not be adopted, some of the Western delegations were quick to link the funds they were offering to the developing countries' acceptance of the Accord, or what a developing country delegate called a 'bribe'. Ed Miliband, the UK's climate minister, was particularly blunt about this linkage and demanded that those who supported the Accord should register this support. The concerns he raised had to be duly noted 'otherwise we won't operationalise the funds'. The United States said it wanted an arrangement through which Parties would associate with the Accord. It affirmed that there were funds in the Accord and that these were 'open to any Party that is interested.'¹

¹ This account of the proceedings and the statements made is based on the author's own recollections, from being present at the meeting.

This implied that Parties not registering their endorsement of the Accord would not be eligible for funding. This attempted linkage of finance to the acceptance of the Accord is of course not in line with the rules of the Climate Convention, in which the developed countries have committed themselves to providing developing countries with the funds needed for them to take massive climate-related actions.

Eventually when it was clear that the rules of procedure made it impossible to convert a non-adoption into an adoption of the Accord, a compromise was reached for the Copenhagen Accord to be merely 'noted' and not adopted by the Conference.

Understanding the Copenhagen Accord

The actual Copenhagen Accord² itself is only three pages in length. What is left out is probably more important than what it contains.

The Accord does not mention any figures for the emission reduction that the developed countries are to undertake after 2012, either as an aggregate target or as individual country targets. This failure to attain reduction commitments is the biggest failure of the document and of the whole Conference.

It marks the failure on the part of the leadership of developed countries, which are responsible for most of the greenhouse gases retained in the atmosphere, to commit to an ambitious emissions target. While the developing countries have demanded that the aggregate target should be over 40 per cent reductions by 2020 compared to 1990 levels (which would, in fact, be insufficient in the light of recent climate science),³ the national pledges by developed countries amounted to (and still amount to) only 13-19 per cent in aggregate.

The Accord only asks each country to inform the rest what it is prepared to do. There is no collective assessment of whether each country's pledge is adequate, no system of ensuring there is comparability of effort and no mechanism to assess whether the aggregate level of emission is adequate to meet the scientific requirement.



2 The document FCCC/CP/2009/11/Add.1 (UNFCCC, 2010) provides decisions of the Conference of the Parties at COP 15, including the Copenhagen Accord.

3 See article by Kevin Anderson in this volume.

Earlier versions of the Accord ('the Danish texts') contained an indication that there would be an aggregate figure (denoted as X in the draft) for Annex I countries collectively.⁴ The US effectively had this removed and the final version did not have this figure or an indication that it would be filled in later.

This system of unilateral national pledges for emission reduction is extremely dangerous and represents a significant departure from the Kyoto system where Annex I parties are set a binding aggregate target and then binding national targets for each country.

In its place, the Accord only asks each country to inform the rest what it is prepared to do. There is no collective assessment of whether each country's pledge is adequate, no system of ensuring there is comparability of effort and no mechanism to assess whether the aggregate level of emission is adequate to meet the scientific requirement (let alone ensure that it is).

The only 'peer review' by members is on whether the developed countries implement what they have announced they will do, There is to be no review of the pledges themselves.

Another omission was the lack of assurance that the Kyoto Protocol would continue, with developed countries taking on emission reduction commitments in a second period starting 2013. The continuation of Kyoto was, as we have already seen, a top priority demand of the G77 and China as well as a considerable number of civil society organisations around the world.

The Accord recognises the broad scientific view that global temperature increase should be held below 2°C, and agrees to enhance cooperative action on the basis of equity. This only echoes the view affirmed by India, among others, that accepting a target of temperature limit, whether it be 2° or 1.5°, has to come with a burden-sharing framework, with equity as its basis. However, it does not include the explicit Indian proposal at that time, for a paradigm to be agreed on for the equitable access to global atmospheric space, which would accompany acceptance of a global temperature goal.

The Accord stated the collective commitment of developed countries to provide new and additional 'fast-start' funds totalling us\$30 billion in 2010-2012 through international institutions.

4 A copy of the leaked 'Danish text' can be found at <http://www.guardian.co.uk/environment/2009/dec/08/copenhagen-climate-change?INTCMP=ILCNETTXT3487>

It also introduced the idea that the developed countries would jointly mobilise US\$100 billion a year by 2020 for developing countries. This is weak, as the commitment is only to mobilising funds, not to actually transferring the funds. The amount is also below what is required; moreover, the sources are to include public and private sectors and alternative sources. Thus, it is doubtful whether the new commitment meets the criteria in the Convention for fulfilment of the developed countries' commitment to transfer financial resources. The US\$100 billion is not said to be 'new and additional', so it may include existing funds or already planned funds.

The Accord also contains a lengthy paragraph on the mitigation actions by developing countries, and how these should be measured, reported on and verified (MRV). This was reportedly a heated topic at the small heads-of-state meeting, with President Obama pressing the developing countries, particularly China, to undertake more MRV obligations.

The Accord is a thin document, containing hardly any new commitments by developed countries, with a weak global goal, and paving the way for a shift of paradigms to a weak pledge and review system. It is a sad reflection of the Copenhagen Conference that this problematic document was afterwards held up as a main achievement.

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In the immediate days following the conference, some developed countries, particularly the UK, targeted and blamed China for the failure of Copenhagen. They accused China of leading a blockage of certain items from being included in the Accord, especially a target of a global emissions cut of 50 per cent by 2020 compared to 1990, and a target of an 80 per cent emissions cut by developed countries in the same period.

In fact, these targets, especially taken together, have, for good reasons, been highly contentious during the two years of discussion in the LCA working groups. The acceptance of 2050 targets of a 50 per cent global cut and 80 per cent developed countries' cut, as pushed by some developed countries, would have locked in a most unfair sharing of the remaining global carbon budget as it would have secured a continued overallocation to the developed countries, while freeing them from their historical responsibility and their carbon debt.

They would thereby have been allocated the rights to a large amount of 'carbon space' without facing up to the responsibility to undertake adequate emission cuts or to make financial and technology transfers to developing countries to enable and support them in their mitigation and adaptation actions.



COP 16 Cancun (December 2010)

The 2010 climate conference of the UN Framework Convention on Climate Change (UNFCCC) which took place in Cancun (Mexico) from 29 November to 11 December was problematic and complex in both process and content, and in both aspects it will have ramifications that will take several years to unfold.⁵



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In substance, the conference outcome strengthened the shift in paradigm that came to the fore in Copenhagen the previous year, and had direct consequences for the international climate regime. In particular, it may have prepared the way for the demise of the Kyoto Protocol (or for its temporary survival in extremely weakened conditions) and thus of the crumbling of the foundation of the architecture agreed to in the Bali climate conference in December 2007, which launched the Bali Road Map. In general, it weakened in operational terms the critical principles of equity and common but differentiated responsibilities by blurring the distinctions between developed and developing countries in their respective and qualitatively different types and levels of commitment and responsibilities, especially the reduction of emissions of greenhouse gases.

In terms of process, the Cancun conference saw the use of a combination of methods of work and decision-making that are not normally used in United Nations conferences. It has clearly set a precedent of sorts for a UN meeting by using old World Trade Organization-style methods and processes to reach an outcome. Even recent WTO ministerial conferences no longer use these methods.

⁵ See http://unfccc.int/meetings/cancun_nov_2010/items/6005.php for the package of Cancun decisions.

In the final sessions, the Mexican Chair of the conference gavelled through the key decision documents despite the strong objection of one country, Bolivia, in so doing stating that this was in line with the consensus principle. But at the UN as well as at the World Trade Organization, consensus is taken to mean that no member present formally objects to a key decision.⁶ The Cancun conference Chair's interpretation of consensus may have ramifications for decision-making not only for future meetings of the UNFCCC but for other UN fora as well.

All (on US terms) or nothing

At the start of the Cancun conference, the developing countries and their groupings insisted that the continuation of the Kyoto Protocol (and its top-down approach) and an agreement on ambitious figures for its second period would be a condition for a successful outcome. In contrast, the United States stressed two priorities: ensure that the mitigation targets that all developed countries and some developing countries had pledged under the Copenhagen Accord were accepted as the targets inside the Convention; and getting developing countries to agree to its proposal of a strong system of MRV (measuring, reporting and verifying) of their mitigation actions supported by international financing, and of ICA (international consultation and analysis), a weaker form of MRV, of their domestically funded actions. The US made it clear that unless these goals were met, there could be no decisions taken on other areas, including finance, technology transfer, and adaptation. According to the worldview of the US, developing countries should be treated in similar fashion to developed countries, and vice versa. This means the principles of equity and common but differentiated responsibilities would be greatly weakened in crucial operational terms.

Developing countries and civil society groups at Cancun criticised the US for holding the developing countries hostage and insisting on getting its own way on the issue of mitigation.

Thus a minimal or modest result on issues already agreed on could not be accepted by the US. It was to be all or nothing, and the threat of a collapse was held out to be a real possibility; this threat was used by developed countries as leverage to get more and more of what they wanted. In a way this US strategy forced the Mexican hosts to decide to manage the conference, overall, on this risky all-or-nothing basis.

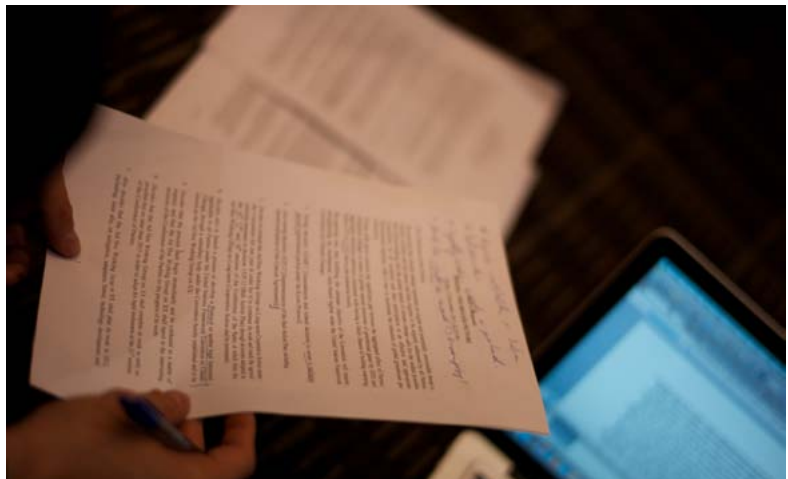
⁶ At the WTO itself, where decision-making by consensus has been the rule, consensus is also defined in the usual way. A footnote in the Marrakesh Agreement that established the WTO defines it as such: 'The body concerned shall be deemed to have decided by consensus on a matter submitted for its consideration, if no Member, present at the meeting, when the decision is taken, formally objects to the proposed decision'.

The US strategy paid off. It seemed as if the conference was organised to revolve around meeting the requirements of the most powerful country, the United States, allowing very modest progress to be made in other areas, which would prevent Cancun from being described as a total failure. This was perhaps the greatest irony at Cancun: that the developed country with the weakest political capacity to offer anything concrete or adequate in its own climate mitigation commitment should be calling the shots. Instead of Cancun becoming a forum where the US would be pressured to take on more action, it became a venue in which the US could extract the maximum price out of developing countries just so that some very modest progress (mainly the establishment of institutions) could be shown to the world. And in the process, the world and its climate paid the heaviest price, the downgrading of developed countries' mitigation from a binding and top-down system of disciplines to one of voluntary pledges.

Complicated WTO-type processes used at Cancun

The acceptance of a set of decisions at Cancun that were so weighted against the developing countries would probably not have been achieved if the open and participatory process normal in the UN had been used, with the negotiators and experts in charge. Usually the negotiators would have almost-finalised texts for ministers to consider and adopt, or else a decision would be taken to transfer the unfinished work to another round of negotiations. At Cancun, a few drafting groups (especially on finance) were still doing their work in attempts to narrow the differences. However, most of the negotiators and their processes were overtaken by a series of new methods of work that are often used at the World Trade Organization but not at United Nations meetings.

The final document was given to delegates with only a few hours to consider at the very end of the conference, on a take-it-or-leave-it basis.





At the final plenary, Bolivia rejected the text, and its ambassador, Pablo Solón, made a number of statements giving detailed reasons why.

The host country, Mexico, organised meetings in small groups led by itself and a few ministers whom it selected. There were small ‘Green Room’ meetings, informal consultations and ‘confessionals’ (in which individual delegations are asked their positions) conducted by pairs of ministers and by the presidency of the conference (Mexico), informal plenaries to inform all participants on what was going on, and texts written or issued by facilitators and eventually put together by Mexico.

The final document was produced not through the usual process of negotiations among delegations, but compiled by the Mexicans (it is still unclear who took part in the drafting), and given to the delegates with only a few hours to consider at the very end of the conference, on a take-it-or-leave-it basis (no amendments were allowed).

At the final plenary, Bolivia rejected the text, and its ambassador, Pablo Solón, made a number of statements giving detailed reasons why. Bolivia could not accept a text that changed the nature of developed countries’ commitments to a voluntary system of pledges; nor could it accept the low pledges they had made, which would lead to a disastrous degree of global warming, which its president had termed ecocide and genocide. It could also not accept an undemocratic process through which its proposals (on mitigation, the use of market mechanisms, and on the need to address IPRs) had been swept aside.

Bolivia made it clear it could not adopt the text and that there was thus no consensus. The Mexican foreign minister, Patricia Espinosa, said that Bolivia’s views would be recorded, but that one country could not prevent a consensus, and declared the text adopted.

At Cancun, the events of the last day were not and are still not clear to most of the participants. The Mexican way of organising the writing and later the adoption of the Cancun text raises questions about the future of UN negotiating procedures, practices and decision-making. The importation of old WTO-style methods carries the risk of conferences collapsing in disarray (as has happened in several WTO ministerial meetings) and in biased texts, which have usually been to the advantage of developed countries. Despite the unorthodox methods as far as the UN processes and meetings are concerned, the final texts were in the end accepted by all the delegations (though some registered their concerns and reservations) except for Bolivia.

The approval of developed countries is easy to understand, for most of their positions are reflected in the final texts. The acceptance by developing countries, however, is a more complex issue. One significant

factor was the involvement of several ministers who were concerned more with the general political aspects than the nitty-gritty detailed content of the many issues and their implications. The acceptance of an inadequate and imbalanced outcome was probably also seen by many developing country delegations as the price to pay for getting a result at Cancun, because another collapse would have further undermined the UNFCCC and seriously set back the multilateral climate change process from which they feared it might not recover. The choice presented to them was a take-it-or-leave-it text in an all-or-nothing approach, accompanied by an appeal not to sink the multilateral system – and with some small achievements in their interest. The risk (and political price) of being blamed was perceived to be too high for those delegations that may have wanted to raise concerns or even an overall objection.

Inadequacies and imbalances in the Cancun outcome

Although most of the delegations were relieved that multilateralism seemed to have been preserved at Cancun, many negotiators from developing countries were privately expressing deep disappointment and serious concern that the final texts did not reflect a balanced outcome, that in fact the developing countries had made major concessions and that the developed countries had largely got their way and escaped from their commitments. Moreover, there was serious concern that from a climate-environmental point of view, the texts fell far short of what was required, and had actually gone backwards in terms of controlling greenhouse gas emissions. One senior negotiator from a developing country summed up his feelings, as he was leaving Cancun: ‘We saved the system but the climate and people were sacrificed.’

Inadequate emissions reductions

The Cancun conference suffered an early blow from Japan’s bold announcement that it would never agree to making another commitment under the Kyoto Protocol. With the Protocol’s first commitment period ending in 2012 the deadline for finalising the emission-reduction figures for the second period had long passed in 2009 (Annex 1 countries had committed to come up with an aggregate figure, in line with science, by March of 2009, but were still refusing to discuss any figures during the negotiations). The developing countries had made it their main demand that the figures for the Kyoto Protocol’s second period be finalised in Cancun, or at least that a clear road map be drawn up for their finalisation in 2011. However, this goal was swept aside by Japan’s uncompromising stand on day one and the conference never recovered from that blow.

The final text failed to ensure the survival of the Protocol, though it set some terms of reference for continuing the talks in 2011. The Cancun

meeting in fact made it more likely that developed countries would move away from the Kyoto Protocol and its binding regime of emission reduction commitments, to a voluntary system in which each country only makes pledges on how much it will reduce its emissions.

In the Kyoto Protocol system it had already been agreed that for the second commitment period, a top-down aggregate reduction figure based on what science requires⁷ would first be agreed on, and then developed countries would have to make their national commitments and these would all have to add up to the aggregate. In a voluntary pledge system, there would be no agreed prior aggregate figure, and no system of ensuring that the sum of pledges is ambitious enough to meet the scientifically required level.

The Cancun text also ‘took note’ of the emission reduction targets that developed countries gave under the Copenhagen Accord and has placed them in a document under the Convention, thus for the first time ‘anchoring’ the Accord’s pledges inside the Convention, thus fulfilling a prime goal of the US. But these are overall such poor targets that a UN Environment Programme report (UNEP, 2010) warned that if they are implemented the developed countries by 2020 may decrease their emissions by only a little (16 per cent) in the best scenario (that is, if the top end of the range of pledges is implemented), or even increase their level (by 6 per cent) in a bad scenario (if the bottom end of the range is implemented and if various loopholes are allowed). The world would be on track for a temperature rise of 3–5°C by the end of the century, which would be catastrophic.

The text urged developed countries to increase the ambition of their mitigation targets, and refers to the IPCC recommended target (thus making an indirect reference to the 25–40 per cent aggregate emission-reduction figure), and hints that the pledges made should be taken as only an initial starting point. But this ‘urging’ is far weaker than the Kyoto Protocol’s binding top-down system, and the AWG-LCA’s obligation for developed countries that are not Kyoto Protocol Parties (i.e. the United States) to make a comparable effort. In fact, this ‘urging’ paragraph is what is left of the two pillars of developed-country mitigation in the three-pillared Bali mitigation architecture. With the crumbling of these two pillars, the developed countries are now focusing on shifting the weight to the remaining third pillar – the mitigation actions of developing countries.

7 This is generally taken to be the estimate in the report of the Intergovernmental Panel on Climate Change (IPCC, 2007) of 25–40 per cent by 2020 compared to 1990, with a more ambitious 40–50 per cent for Developing countries)

Many earlier drafts (for example the 13 August 2010 text which compiled the proposals made by Parties) contained the option that developing countries put forward or endorsed, that the developed countries' commitments must achieve the reduction of their aggregate emissions by either 30, 40, 45 or 50 per cent (reflecting the various proposals) by 2020 and that the developed countries which are Kyoto Protocol members shall make their commitments in the second period of the Protocol, while non-Protocol developed countries (the US) would have its reduction figure reflected in the AWG-LCA's decision under the Convention. This option was eliminated in the Cancun outcome. The replacement of this option with the voluntary national pledging system (accompanied by a weak 'urging' paragraph) in which the Kyoto Protocol was not even mentioned prepares the ground for the replacement of one regime with another. This laying of the foundation for 'regime change' is perhaps the single most important implication of the Cancun outcome.

Even as it facilitated the 'great escape' of developed countries from their commitments, the Cancun text introduced new disciplines for developing countries. Indeed what is really new in the Cancun outcome is the vastly expanded mitigation obligations placed on developing countries. The developing countries are now obliged, through the Cancun text, to put forward their plans and targets for climate mitigation, which are to be compiled in a document, and later in several registries to be regularly updated. It is a first step in a plan by developed countries (which they have been quite open about) to get developing countries eventually to turn their mitigation targets into commitments in national schedules.

New obligations for developing countries for MRV and ICA

The Cancun text also obliged developing countries to report on their national emissions, mitigation actions and their effects in national communications reports once every four years, and also to submit biennial update reports on the same topics. In other words, the reporting will be once every two years. These reports (to include information on mitigation actions, details of emissions, analysis of impacts, methodologies and assumptions, progress on implementation and information on domestic 'measuring, reporting, and verification' (MRV) are to be subjected to scrutiny by other countries and by international experts. The Cancun text in fact gives a great deal of space to the details of these MRV measures and international consultation and analysis (ICA) procedures.

These are all new obligations, and a great deal of time was spent in Cancun by the developed countries (especially the US) in getting the developing countries to agree to the details of MRV and ICA. While international MRV of internationally financed mitigation actions by

developing countries was agreed to by all in Bali, it was understood that there would not be international scrutiny of actions that are domestically funded. The Copenhagen Accord changed this understanding, adding on the obligation of international consultation and analysis (ICA) for domestically financed mitigation actions. Many developing countries still have not associated with the Copenhagen Accord and thus have not agreed to an ICA system. The Cancun decision, however, now obliges all developing countries to be part of an ICA regime. Many developing-country officials were increasingly worried in Cancun about how they were going to implement these new obligations, as a lot of people, skills and money will be needed to prepare the reports, while the mitigation actions themselves may involve major changes in their production and economic systems. While the new mitigation obligations on developing countries were expanded in detail in Cancun, there was no corresponding clarity that funding and technology support (that developed countries committed to) would be forthcoming. This of course has added to the anxiety of developing countries.

In fact, the developing countries made considerable concessions and sacrifices at Cancun, while the developed countries managed to have their obligations reduced or downgraded.

Cancun may be remembered in future as the place where the UN-FCCC's climate regime was changed significantly, with developed countries being treated more and more leniently, while developing countries are asked to increase their obligations. The ground was being prepared for a new system that would blur the differences currently existing between the mitigation commitments of developed countries and the mitigation actions of developing countries, and then replace the Kyoto Protocol and change the meaning of the Convention itself. Cancun will be seen as a milestone in facilitating this regime change.

Shared vision

In the section on 'shared vision', the Cancun text recognised the need to limit temperature rise to 2 °C and that Parties should take action to meet this goal consistent with science and on the basis of equity. Although the crucial principle of equity is recognised here, the proposal that India and many other countries had made (and that had been placed as an option in earlier drafts) that the goal should be 'preceded by a paradigm for equitable access to global atmospheric space' has been eliminated.

Also in this section, the Parties agreed to achieve the peaking of global and national emissions as soon as possible, with the timeframe to be worked out within a year. Since many developed countries have already

reached an emissions peak and are now reducing emissions, what is new is the national peaking by developing countries. The agreement to achieve their national peaking as soon as possible when many of them still have very low levels of emissions (and are at a low economic level) raises many questions as to whether and when they can achieve such a target.

On the demands of developing countries for actual implementation of developed countries' commitments to transfer finance and technology, the Cancun decision falls far short of concrete action or even concrete commitments. The measure agreed to is only to establish new institutional arrangements. Actual implementation is not addressed.

Climate finance

The Cancun conference agreed to establish a new Green Climate Fund to function under the UNFCCC to finance mitigation and adaptation actions in developing countries.

No decision was taken on how much money the fund will get. However, the text repeats the Copenhagen Accord language that the developed countries commit to a goal of mobilising US\$100 billion per year by 2020. While developing countries have insisted that most of the financing should be in the form of grants or payments and not loans, and should be sourced from the public sector rather than from the private sector or markets, the Cancun text mentions a wide variety of sources of funding, 'public and private, bilateral and multilateral, including alternative sources'. Moreover, the commitment is only to a 'goal of mobilising', and not to actual payment of the funds mentioned, and even this weak goal is made conditional by being in the 'context of meaningful mitigation actions and... transparency'. This implies that the funds will be raised only if developing countries take on 'meaningful' actions and implement 'transparency' mechanisms (presumably involving MRV and ICA) to the satisfaction of the developed countries. The US\$100 billion amount is far below what many studies estimate is needed by developing countries for their climate actions (UN-DESA, 2010; UN-DESA 2012; World Bank 2010a; World Bank 2010b; Montes, 2012), and also far below the G77 and China's proposal that developed countries contribute 1.5 per cent of their GNP (which currently adds up to US\$600 billion).

A transitional committee was also set up to design various aspects of the Green Climate Fund. One important issue is the governance of the Fund. The Cancun decision is that a 24-member Board will govern the Fund, with equal representation between developed and developing countries. This is the proposal of developed countries, whereas the G77 and China had advocated for an 'equitable representation', which



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would have meant a majority of Board members would be from developing countries. In the Cancun decision, developing countries, with four-fifths of the world's population, would only have half the seats on the Board, which is yet another example of developed countries' proposals holding sway.

It was also agreed in Cancun that the initial trustee of the fund would be the World Bank. This has been a key US demand, which many developing countries had been opposing, as they have had negative experiences with the Bank. The developing countries wanted competitive bidding for choosing the trustee, rather than appointing the Bank up-front.

Adaptation

On adaptation, the Conference of Parties decided to establish an Adaptation Committee to promote enhanced adaptation action, with views on its composition, modalities and procedures to be agreed on in the coming year. In relatively weak language, it also 'recognises the need' to strengthen cooperation to understand and reduce loss and damage associated with climate change, including extreme weather events. The developing countries were advocating a stronger decision, to establish an international mechanism to deal with loss and damage. The text, however, mentions a work programme of workshops and meetings to address this issue.

Technology

A technology mechanism was also set up under the UNFCCC, comprising a technology executive committee of 20 members, and a technology centre and networks. The executive committee as originally envisaged by developing countries was to have decision-making powers. The functions as elaborated in the Cancun text are more in the nature of 'recommending actions' and 'recommending guidance'. The Cancun text avoids any mention of intellectual property rights (IPRs), although the developing countries have argued that IPRs have an important effect on their access to climate-related technologies, and have made it a priority issue in the technology transfer negotiations. Even on the day before the conference closed, a draft text prepared in ministerial-led consultations had three options in a section on IPRs; one was to leave out any mention of IPRs whatsoever; the second was to accept the strong position of many developing countries on reviewing the IPR regime and on the use of TRIPS flexibilities; and the third was to continue the dialogue on IPRs over the next year, or to hold workshops to be organised by other international organisations. It was expected that at least the third option would be accepted. However, the extreme US position, of no mention whatsoever, triumphed. The Cancun text gave up any recognition of the

developing countries' position on IPRs, without even accepting a very diluted compromise to keep talking about the issue.

Markets and trade

On introducing market mechanisms as an issue to be discussed in the AWG-LCA, developing countries have been suspicious that this is a move to enable the shifting of market mechanisms now being used or discussed in the Kyoto Protocol to the Convention track under the AWG-LCA, so that if the Protocol is discontinued, the market elements (such as the use of carbon offsets through the Clean Development Mechanism and other market instruments that some are seeking to introduce) can be installed in a new protocol or agreement. They thus want the issue to remain in the Kyoto Protocol group, rather than being transferred to the AWG-LCA, or at least to postpone a decision on whether to discuss it in the AWG-LCA until the issue of continuing the Kyoto Protocol is settled. This option was included in earlier drafts. However, the option not to have market approaches in the AWG-LCA text has been eliminated in favour of the developed countries' option to launch market-based mechanisms, with details given in the text.

The link between climate change and trade measures is another important issue for developing countries. The earlier negotiating texts contained the proposals by a large number of developing countries in strong language forbidding the use of unilateral trade measures such as border tax measures imposed on imports on the grounds of needing to take climate change actions. However the Cancun decision has totally disregarded these proposals and instead chosen text on this issue that merely reiterates the language of the existing Article 3.5 of the Convention, namely that measures to combat climate change should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on trade. This is seriously inadequate, as it does not add anything new to the Convention to fight against climate-linked protectionism.

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When the dust settles after the Cancun conference, a careful analysis will find that the adoption of an outcome may have given the multilateral climate system a shot in the arm and created positive feelings among most participants because there was something for them to take home, but that it also failed to save the planet from climate change and helped pass the burden of climate mitigation onto developing countries. Instead of being strengthened, the international climate regime was weakened by the now serious threat to close the legally binding and top-down Kyoto Protocol system and to replace it with a voluntary pledge system.

COP 17 Durban (December 2011)



The UN Climate Change Conference held in Durban concluded on the morning of 11 December (two days after its scheduled end) with the launch of negotiations for a new global climate deal to be completed in 2015, and to take effect in 2020.⁸

The new deal aims to ensure ‘the highest possible mitigation efforts by all Parties’, meaning that the countries should undertake deep greenhouse gas emissions cuts, or lower the growth rates of their emissions. It will take the form either of a protocol, another legal instrument or an outcome with legal force.

In a night of high drama, the European Union tried to pressurise India, China and other developing countries to agree to commit upfront that the new talks would lead to a legally binding treaty such as a protocol, and to agree to cancel the term ‘legal outcome’ from the list of possible results, as it said this option was too weak and unacceptable.

The EU had insisted there would be a legally binding agreement covering all countries, as a quid-pro-quo for its member countries to remain in the Kyoto Protocol and take part in a second commitment period.

During the Durban negotiations, the EU and the US made clear they wanted all major economies (a code term to include China, India, Brazil and other unspecified developing countries) to undertake similar emissions-cutting obligations. Inclusion of developing countries is a departure from the Climate Change Convention, which distinguishes between the binding commitments that developed countries have to undertake and the voluntary climate actions that developing countries should do.

Kyoto Protocol bargaining

Much of the Durban conference was caught up in the EU’s bargaining, that is its agreeing to a second commitment period of the Kyoto Protocol only on the condition that new talks be launched on a ‘new legally binding treaty involving all’. And the most important discussion took place in a consultation chaired by the South African foreign minister, Maite Mashabane, in small rooms involving some 30 Parties.

The initial KP proposals put forward by the Chair met with angry responses from almost all developing countries, because they did not enable Durban to definitively launch the second KP period. Countries

⁸ See http://unfccc.int/meetings/durban_nov_2011/meeting/6245.php for decisions and other official UNFCCC documentation from the Durban summit.

were only ‘invited’ to provide their emission-reduction commitments by May 2012, and the KP working group was to be shut down at the end of the Durban conference. Moreover, the draft showed two countries (Australia and New Zealand) taking a wait-and-see approach while three others (Japan, Russia and Canada) were definitely out of the second period. (After the Durban conference, Canada announced it was withdrawing altogether from the Kyoto Protocol).

In the final session, a text on KP was presented which did not much differ from the initial draft. It stated that the second period starts on 1 Jan 2013 and can last for five or eight years (this will be decided in 2012). It took note (i.e. neither approved nor disapproved) of the proposed amendments (arising from the working group) of rules on forest (Land Use, Land-Use Change and Forestry - LULUCF), flexibility mechanisms and methodological issues. It only ‘invites’ (does not mandate) developed country Parties to submit their emission-reduction commitments (known as QELROs) by May 2012 to be considered by the KP working group in June; and requests the group to submit these figures to the Conference of Parties (in December 2012) ‘with a view to adopting these QELROs as amendments to Annex B of the KP’.



Niclas Hällström

At the plenaries on the night of 10 December, several developing countries expressed concern about the weakness of this text and asked for revisions. However, no revisions were allowed (except a request by the EU to allow the duration of the period to be five or eight years) and the text was gavelled through as part of the Durban package.

This KP decision gives no clear assurance that a second period will actually occur because the developed country Parties might not submit

their emission-reduction commitments (QELROs) in time to be considered by the KP Working Group.⁹ The non-participation of several important developed countries in the Kyoto Protocol's second period is of course a major blow to the Protocol and what it stands for.

Establishment of the Durban Platform

The Kyoto Protocol was thus barely kept alive. In exchange for this, the EU (backed by several developing countries including members of the Alliance of Small Island States) pushed for a decision that negotiations would start immediately for a new legally binding treaty involving all Parties. It called for deletion from the draft decision of the option of 'legal outcome', and the retention only of two options, a protocol or other legal instrument.

Conspicuously absent from the draft decision was any mention of the principles of equity and common but differentiated responsibility (CBDR), which are cornerstones of the UNFCCC and of critical importance to developing countries. The US in particular insisted that these principles should not be mentioned, while India led several developing countries in insisting that they should be included.

At the closing plenary on 11 December, India's environment minister, Jayanthi Natarajan, gave a passionate defence of why India was against committing to a legally binding protocol, and of the need to base the new talks on equity. She argued: 'Why should India give a blank cheque by agreeing upfront to joining a protocol when the content of that protocol is not yet known? We are not talking about changing lifestyles but about the effects on the livelihoods of millions of poor farmers. Why should I sign away the rights of 1.2 billion people? Is that equity?'

Ms. Jayanthi said that the resolution on the new round of talks did not even contain the words 'equity' or 'common but differentiated responsibility', an expression in the Convention meaning that rich countries should contribute more than poor ones in the fight against climate change. If such a protocol is developed, in which poor countries had to cut their emissions as much as rich countries, Ms. Jayanthi argued, '...we will be giving up the equity principle. It is goodbye to common and differentiated responsibility. It would be the greatest tragedy.'

⁹ Or if they are submitted, the Conference of Parties might end up not accepting the QELROs if they are not ambitious enough; or if the Conference adopts the QELROs and the amendments to the KP, it is not possible they will be ratified and enter into force before 1 January 2013, so there will be a legal gap between the first and second periods.

After a half-hour break where several countries tried to arrive at a compromise, it was agreed that the term 'legal outcome' be changed to 'outcome with legal force'. The US insisted that equity should not be mentioned in the document.



Niclas Hällström

Several countries, including China, the Philippines, Pakistan and Egypt, supported India's position. The EU, however, still insisted on removing 'legal outcome' from the text, but it agreed to discuss the equity concerns raised by India. After a half-hour break where several countries tried to arrive at a compromise, it was agreed that the term 'legal outcome' be changed to 'outcome with legal force'. The US insisted that equity should not be mentioned in the document. The Conference then approved the launching of the new talks.

The key paragraph of the decision on the Durban Platform was that Parties agreed to:

launch a process to develop a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all Parties, through a subsidiary body under the Convention hereby established and to be known as the Ad Hoc Working Group on the Durban Platform for Enhanced Action.¹⁰

Several legal experts and senior negotiators from developing countries are of the view that even though equity and CBDR are not explicitly mentioned in the Decision, in fact the reference to 'under the Convention' means that the provisions of the instrument or agreed outcome have to be consistent with and reflect the UNFCCC's principles and provisions, including those that relate to equity, CBDR and the different responsibilities of developed and developing countries.

¹⁰ The document 'Decision 1/CP.17 Establishment of an Ad Hoc Working Group on the Durban Platform for Enhanced Action, can be accessed at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf#page=2>

Details of the framework for the new negotiations were not spelt out in the decision, which mandates that these be worked out in 2012. Thus, it can be expected that there will be a major battle on the principles and major contours of the framework of the new deal. On the one hand, the US will insist that the absence of the word ‘equity’ in the decision means that there is to be no ‘firewall’ between the obligations of developed and developing countries, which should be treated in the same way. On the other hand, many developing countries, including India and China, will argue that the equity and CBDR principles should be central to any deal.

Controversial winding down of the Bali Road Map

The Durban conference also took steps to wind down the current framework of climate talks, comprising the Kyoto Protocol’s second period and the Bali Action Plan, which together form the Bali Road Map.

The Kyoto Protocol was saved from extinction by a weak decision to consider the commitments that those remaining developed countries are invited to submit. But Kyoto has been significantly and perhaps fatally weakened. With perhaps only the European countries left, the Kyoto Protocol may live on till 2017 or 2020, but by then it may already be overshadowed by the new Durban Platform.

The other ad hoc working group – on long-term cooperative action – was apparently given only one more year of life, to wind up its work, even though many important components (especially on equitable access to sustainable development space, long-term finance and technology transfer) have yet to be elaborated. The relevant paragraph (Para 1 in Decision 1/CP.17) states the decision to extend the AWG-LCA for one year ‘for it to continue its work and reach the agreed outcome pursuant to decision 1/CP.13 (Bali Action Plan)...at which time [the AWG-LCA]...shall be terminated’.

In fact this decision did not emanate from negotiations, and the developing-country delegations did not see the text on the closure of the AWG-LCA until the final hours of the Conference. Moreover, the report prepared by the Chair of the AWG-LCA, Daniel Reifsynder of the US, had been rejected by several developing countries at the final plenary meeting of this group, as being biased against them and not reflecting their views on many issues. Moreover, the report implied that on some issues of crucial importance (for example, intellectual property rights in relation to access to technology; unilateral trade measures; comparability of mitigation efforts by all developed countries), there would be no need for any further discussion or decision. In a move unprecedented in the prior history of the UNFCCC, the Chair ignored

In a move unprecedented in the prior history of the UNFCCC, the Chair ignored the explicit objections of several members of the group and sent the report, 'on his own responsibility', to the Conference of Parties for it to adopt.



Shubert Ciencia

the explicit objections of several members of the group and sent the report, 'on his own responsibility', to the Conference of Parties for it to adopt (the same procedure also took place in the AWG-KP session). Consequently, a few hours later, it was adopted by the COP as part of a package of adoption of several documents. This explains why many developing countries' delegations have been fighting to revive several of their issues and proposals in the resumed meetings of the AWG-LCA in May and August/September 2012. However, the response of most developed countries is that these issues or proposals should not be revived, as their treatment had already been settled in Durban.

Some developing countries' delegates have also argued that the Durban decision was not definitively to close down the AWG-LCA at the end of COP 18 in Doha in November–December 2012. The language in the paragraph is that the AWG-LCA's should continue its work and reach the agreed outcome of the Bali Action Plan. Thus only when the agreed outcome is reached would the group be terminated, according to this interpretation. However, at the post-Durban negotiations in Bonn (May 2012) and Bangkok (September 2012), many of the developed countries made it clear they want the AWG-LCA to be closed down by COP 18.

One achievement in Durban was the finalisation of the governing instrument of the new Green Climate Fund. The draft instrument submitted by the Transition Committee to design the Fund was accepted, but with the addition of some important clarifications contained in a Decision by the COP. It was also agreed that the UNFCCC secretariat and the Global Environment Facility would jointly run the interim secretariat for two years, after which an independent secretariat would operate.

Controversial process, lacking transparency¹¹

At times the Durban talks looked as if they were going off track, with disagreements on many issues. Even at the last session, there were grumbles about how resolutions and texts were being pushed through without allowing for changes.

The basic differences were most evident in the discussions on the reports of the working groups, and on the draft COP decision on the Durban Platform during the plenary meetings on the final night running into the morning of Sunday 11 December. These sessions all took place long after the Conference was scheduled to end (Friday 9 December) and when the ministers and senior officials of many developing countries had already left Durban. The Durban Platform proposal was given to participants along with three other draft decisions (relating to the AWG-KP, the AWG-LCA and the Green Climate Fund) as a package on a take-it-or-leave-it basis, which allowed no time or opportunity for them to consult among themselves and within and between their groupings.

At the closing sessions of the AWG-KP and AWG-LCA working groups held on Saturday evening before the Conference of the Parties (COP)/Parties of the Kyoto Protocol (CMP) joint informal session, many Parties raised several concerns they had on the respective reports by the Chairs of the two working groups, which they felt did not fully reflect the outcomes of the work. Several delegations expressed frustration that their concerns were not being heard. In the case of the AWG-KP session, several developing countries wanted amendments to be made to the outcome document but none was entertained by the Chair, Adrian Macey from New Zealand, except for the amendment suggested by the EU on the duration of the second commitment period. The report and the outcome of the work of the AWG-KP were presented 'under the authority and responsibility of the Chair', that is, the document was taken forward to the concluding CMP session without the endorsement of all countries, which was an unprecedented move.

Likewise, in the case of the outcome of the work of the AWG-LCA, as described earlier, the Chair of the working group, Daniel Reifsnyder from the US, ignored calls by several developing countries not to adopt the report and to allow for further work to be done the following year on the outcome document to rectify the existing imbalances, especially as the document had only been presented to Parties in the late morning of the last day (10 December). The Chair did not agree with this proposal to extend and reconvene the meeting and proceeded, just as



Sarah Marchildon

¹¹ This section draws on an article by Meena Raman (2011).

in the other working group, to transmit the document to the COP President under his own responsibility.

The often heated exchange on the Durban Platform, including the ‘huddle’, took place at the joint informal plenary meeting of the COP 17 and the CMP 7 convened by the COP/CMP President, Ms. Mashabane, immediately following the closing sessions of the two main working groups (AWG-KP and AWG-LCA).

Ms. Mashabane outlined the elements of the ‘Durban package’ (the four documents on the Kyoto Protocol, AWGLCA, Green Climate Fund and the Durban Platform) and asked Parties to adopt each of the decisions without further debate and amendments when they were to be presented during the concluding formal sessions of the COP and the CMP that would follow thereafter, saying that Parties required ‘assurances from each other to agree to all the draft decisions’, clearly suggesting a ‘take-it or leave-it’ approach. She said that this was needed to ‘make history and strengthen multilateralism’.

The formal concluding sessions of the CMP and the COP were convened one after another. At both the CMP and COP, several concerns were raised over the process and outcome of work but these concerns were not addressed by Ms. Mashabane, who proceeded to gavel the adoption of the outcomes.

The decision on the Durban Platform and how it was reached will be debated for a long time to come. It was also unusual that a decision to launch such an important negotiation was made with very few terms of reference to frame the talks or their outcome. The details of the terms of reference are now scheduled to be worked out in the coming year. Given the circumstances in which the Durban Platform was launched, these talks on the framework to underpin the new regime can be expected to be tough and lengthy. This is all the more likely because different Parties have different paradigms on the substance and shape of a fair and effective climate change regime.

During and after the meeting, negotiators of many developing countries expressed deep concern about the procedures for adopting decisions in Durban. The conference had been extended for almost two days, and ministers and officials of many countries had already left. The closed-door meeting of about 30 parties left many others, who were not invited, in the dark.

The documents for the decisions in the final plenary meetings were distributed late, and some Parties complained they did not have the papers. There was no time for the Parties to study the papers. The Chairs of the AWG-KP and AWG-LCA did not take into account the disagreements that most Parties registered on the draft decisions but decided to transmit their reports almost unchanged to the final plenary of the COP and CMP. When the COP and CMP meetings were convened, there was little opportunity to re-open the reports, with the use of the argument that all the four documents had to be adopted together as parts of a single Durban package. Some attempts made by developing countries were ignored, while the only opportunity to re-open discussion was provided to the EU over the 'legal outcome' issue.

While COP 17 and the CMP 7 did not fall apart as many had predicted in the last day of the conference, the manner in which the decisions were achieved may be debated including what it means for the future of decision-making in a UN multilateral setting for years to come.

Conclusion

This article has described the twists and turns of negotiations at the COP of the Convention and the CMP of the Kyoto Protocol in recent years. At these important meetings, the interests of a large number of developing countries have lost ground. While developed countries were able to have their commitments (especially in mitigation) downgraded, new significant obligations were placed on developing countries in terms of their 'nationally appropriate mitigation actions', with an elaborate system of monitoring, reporting and verification. The original architecture for mitigation (a top-down science-based set of emission reduction commitments for all developed countries, with comparable efforts being made by each of them, and more obligations in mitigation and reporting for developing countries) has not been maintained. Furthermore, the Convention's principles of equity and common but differentiated responsibilities and respective capabilities are also being weakened, and attempts are being made by some developed countries to undermine them further by treating all countries similarly in the new Durban Platform.

The recent COPs also show that various procedures and processes have been used to push through important decisions and documents which would have been opposed successfully by many developing countries if normal participatory processes of the UNFCCC and the UN in general had been followed. The attempt to force through a document emanating from closed-door small meetings failed in Copenhagen. New methods used in Cancun and in Durban succeeded in having de-

cisions and documents adopted by the COP and the CMP. Too much power and authority have in practice been accumulated by the officials of the country that hosts the COP. Instead of being a host and provider of facilities in a venue of meetings, the host country has become prime determinant of process and substance through the new practice of providing the President with draft texts and then having them adopted.

This also shows that processes and substance are interrelated because certain processes or procedures can push through decisions containing substance that would otherwise have been rejected.

Both in process and substance the multilateral system for addressing climate change is in a state of flux, which has often been on the borders of crisis. Ownership of the process by all is important, otherwise decisions that many believe were not reached fairly can lead to the later re-opening of the decisions, or to problems of implementation. For the developing countries, there is still a long way to go to ensure that global climate negotiations lead to fair and effective agreements and actions, backed up by the required financial and technological support. Reforms are obviously needed. Unfortunately there is no time left to waste in humanity's common fight against destructive climate change, as the recent extreme weather events demonstrate.

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Why Bolivia stood alone in opposing the Cancun climate agreement

Pablo Solón

Diplomacy is traditionally a game of alliances and compromise. Yet, in the early hours of Saturday 11 December 2010, Bolivia found itself alone against the world: the only nation to oppose the outcome of the United Nations climate change summit in Cancun. We were accused of being obstructionist, obstinate and unrealistic. But in truth we did not feel alone, nor were we offended by the attacks. Instead we saw an immense obligation to set aside diplomacy and tell the truth.

The ‘Cancun accord’ was presented late Friday afternoon (10 December) and we were given two hours to read it. Despite pressure to sign something – anything – Bolivia requested further deliberations. This text, we said, would be a sad conclusion to the negotiations. After we were denied any opportunity to discuss the text, despite a lack of consensus, the president banged her gavel to approve the document.

Many commentators have called the Cancun accord a ‘step in the right direction’. We disagree. It is a giant step that replaces binding mechanisms for reducing greenhouse gas emissions with voluntary pledges that are wholly insufficient. These pledges contradict the stated goal of capping the rise in temperature at 2°C, instead guiding us to 4°C or more. The text is full of loopholes for polluters, opportunities for expanding carbon markets and similar mechanisms – such as the forestry scheme called REDD – which reduce the obligation of the developed countries to act.

Bolivia may have been the only country to speak out against these failures, but several negotiators told us privately that they supported us. Anyone who has seen the science on climate change knows that the Cancun agreement was irresponsible.

In addition to having science on our side, another reason we did not feel alone in opposing an unbalanced text at Cancun is that we received thousands of messages of support from women, men and young people of social movements that have stood by us and helped inform our positions. It is out of respect for them, and humanity as a whole, that we feel a deep responsibility not to sign off on any paper that threatens millions of lives.

Some claim that the best thing is to be realistic and recognise that, at the very least, the agreement saved the UN system from collapse.

Unfortunately, a convenient realism has become all that the powerful nations are willing to offer, while they ignore scientists' exhortations to act radically now. The UN Intergovernmental Panel on Climate Change has found that in order to have a 50 per cent chance of keeping the rise in temperature below 1.5°, emissions must peak by 2015. The attempt in Cancun to delay critical decisions until next year could have catastrophic consequences.



Michael Oke, World Resources Institute

After we were denied any opportunity to discuss the text, despite a lack of consensus, the president banged her gavel to approve the document.

Bolivia is a small country. We are among the most vulnerable nations when it comes to climate change, but with the least responsibility for causing the problem. Studies indicate that our capital, La Paz, could become a desert in 30 years. What we do have is the privilege of being able to stand by our ideals, of not letting partisan agendas obscure our principal aim to defend life and the Earth. We are not desperate for money; the US has already cut our climate funding. We are not beholden to the World Bank, as so many of us in the South once were. We can act freely and do what is right.

Bolivia may have acted unusually by upsetting the established way of dealing with things. But we face an unprecedented crisis, and false victories won't save the planet. We must all stand up and demand a climate agreement strong enough to match the crisis we confront.

'The Great Escape III'

Pablo Solón

This commentary was written on 7 December 2011, three days before the Durban negotiations ended on overtime, with many developing country negotiators having already left Durban.

Durban, South Africa

After nine days of negotiations there is no doubt that we have seen this movie before. It is the third remake of Copenhagen and Cancun. Same actors. Same script. The documents are produced outside the formal negotiating scenario, in private meetings and dinners, which the 193 member states do not attend. The result of these meetings is known only on the final day. In the case of Copenhagen it was at 2.00 in the morning, after the event should have already ended. In Cancun, the draft decision appeared only at 5.00 p.m. on the last day and was not opened for negotiation, not even to correct a comma. Bolivia stood firm on both occasions. The reason: the very low emission reduction commitments of industrialised countries that would lead to an increase in average global temperatures of more than 4°Celsius.

In Cancun, Bolivia stood alone. It could not do otherwise. How could we accept the same document that was rejected in Copenhagen, knowing that 350,000 people die each year due to natural disasters caused by climate change? To remain silent is to be complicit in genocide and ecocide. To accept a disastrous document in order not to be left alone is cowardly diplomacy. Even more so when one trumpets the 'people's diplomacy' and has pledged to defend the 'People's Agreement' of the World People's Conference on Climate Change and the Rights of Mother Earth held in Bolivia last year.

Durban will be worse than Copenhagen and Cancun. Two days before the close of the meeting, the text being negotiated is still unknown. Everyone knows that the actual 131-page document to be discussed is merely a compilation of proposals that were already on the table [at the negotiations] in Panama two months ago. The formal negotiations have barely advanced since. The real document will appear towards the end of COP17.

But more importantly, the substance of the negotiations remains unchanged from Copenhagen. The emission reduction pledges by developed countries are still 13–17 per cent based on 1990 levels. Everyone knows that this is a catastrophe. But instead of becoming outraged, they attempt to sweeten the poison. The wrapper of this package will be the second commitment period of the Kyoto Protocol and a mandate for a new binding agreement. The substance of the package will be the same as in Copenhagen and Cancun: do virtually nothing during this decade in terms of reducing emissions, and get a mandate to negotiate an agreement that will be even weaker than the Kyoto Protocol and that will replace it in 2020. ‘The Great Escape III’ is the name of this movie, and it tells the story of how the governments of rich countries along with transnational corporations are looking to escape their responsibility to reduce greenhouse gas emissions.

In response to the failed Copenhagen summit, Bolivia took the initiative to organise the 'World People's Conference on Climate Change and the Rights of Mother Earth' in Cochabamba, April 2010. Approximately 30 000 people from over 100 countries participated. The results of the deliberations were formally moved into the climate negotiations through submissions by Bolivia.
<http://pwccc.wordpress.com>

Instead of becoming stronger, the fight against climate change is becoming more soft and flexible, with voluntary commitments to reduce emissions. The question is, who will step up this time to denounce the fraud to the end? Or could it be that this time, everyone will accept the remake of Copenhagen and Cancun?

The truth is that beyond the setting and the last scene, the end of this movie will be the same as in Copenhagen and Cancun: humanity and Mother Earth will be the victims of a rise in temperature not seen in 800,000 years.



What happened in Durban?

Extract from *'What happened in Durban... what must happen next: A civil society analysis of the state of UN climate negotiations'*, 12 May 2012.

The Kyoto Protocol: An empty shell?

The Durban outcome confirms that a second period of commitments for developed countries will take place under the Kyoto Protocol starting 1 January 2013 and ending 31 December 2017 or 2020. In so doing, it maintains the system of rules embodied in the Kyoto Protocol for another period, due in substantial part to the willingness of the EU to remain in the Kyoto Protocol.

The decision, however, is weak on substance and, on close reading, enables developed countries largely to slip out of their obligations to negotiate future, legally binding multilateral mitigation commitments under the Kyoto Protocol. Among other things:

- » The decision merely 'takes note' of developed countries' existing weak pledges at Copenhagen and Cancun, rather than requiring the negotiation of adequate commitments during 2012. 'Take note' is language of no binding force. After six years of discussions, developed countries have 'played out the clock' and avoided multilateral negotiation of their mitigation contributions.
- » It fails to establish a clear process for converting these weak pledges into legally binding commitments (called Quantified Emission Limitation and Reduction Objectives or QELROS), meaning the weak pledges may be converted into even weaker final commitments.
- » It calls for future efforts to address accounting loopholes (such as 'surplus allowances' from the first period). However, it expands others (for example, land use) and includes no systematic process to address all loopholes and to limit carbon markets. In so doing, it fails to ensure that developed countries make real reductions rather than shifting the burden on to developing countries.
- » A number of countries have included footnotes declaring their participation dependent on the outcome of negotiations elsewhere, while some countries – Canada, Japan and Russia – have pulled out altogether. At the end of the Durban meeting, Canada formalised its withdrawal.



Niclas Hällström

An 'Indaba' meeting with a restricted number of countries invited to take part

In sum, the Kyoto outcome establishes a second period, announcing a start and (contested) end date. But on close reading, it is carefully worded to avoid any substantial obligations by developed countries, and it falls far short of what is required for an adequate and legally binding second period of commitments. At best, it becomes a filing cabinet for the weak mitigation pledges the developed countries have imposed on, rather than negotiated with, the poor.

Negotiation on the Kyoto Protocol will continue during 2012. However, the Durban outcome stacks the deck even more heavily against an outcome acceptable to developing countries and to citizens concerned that developed countries do their fair share and don't backtrack on their promises to combat climate change.

Inadequate ambition on mitigation

In Durban, developed countries held to the weak mitigation pledges they put forward in Copenhagen and Cancun. Whereas developing countries have offered up to 5Gt of reductions by 2020, developed countries – which have greater responsibility and capacity – have pledged a much lower 4Gt of cuts.

These, in turn, would be substantially undermined by certain accounting loopholes (around 4Gt) and by carbon markets, which shift the burden of emissions reductions to developing countries, while enabling developed countries to count these reductions towards meeting their own commitments. Developed countries, in other words, based on their current pledges and loopholes, could make no net contribution to curbing climate change by 2020.

While developed countries sought to escape their Kyoto commitments and retain their weak pledges, they pushed forward with a range of proposed new obligations for developing countries, including obligations for 'measurement reporting and verification', a 'registry', 'international consultation and analysis' and 'biennial update reports'.

The negotiations under the convention track addressed shared vision, mitigation, adaptation, as well as finance, technology and capacity, and a review in 2015.

A shared vision?

Under shared vision, the parties agreed to continue negotiating towards a global goal of substantially reduced emissions by 2050 and a peaking year. This is critical, as it defines the global pathway for reducing emissions, and therefore the chances of achieving a 2°C or 1.5°C goal or lower.

A number of developing countries, led by the African group and India, emphasised that defining these global goals (as well as level of effort by developed countries, and financing for developing countries) has significant equity implications.

Parties therefore agreed to consider issues of ‘equitable access to sustainable development’ at the first session in 2012. The outcome of this discussion is critical and will be relevant to continued negotiations under the Framework Convention, the Kyoto Protocol, as well as negotiations towards a new agreement or agreed outcome.

Carbon markets

Developed countries also succeeded in their demands for a new carbon market mechanism outside the Kyoto Protocol.

The Durban outcome defines a new market mechanism that is to operate under the guidance and authority of the Conference of the Parties (COP), which ‘may assist developed countries to meet part of their mitigation targets or commitments under the Convention’. This mechanism in fact risks transferring liability for failure to reduce emissions to the South in the form of financial debt, while counting the supposed reductions against developed countries’ targets even should a project not perform as planned.

In relation to forests, the outcome also prefigures markets for so-called Reducing Emissions from Deforestation and Forest Degradation (REDD) projects by stating that ‘market-based approaches could be developed to support results based actions’. The possibility is left open to expand these to agriculture and soil-carbon, presenting a major risk to farmers in developing countries, who may see part of their soil commodified and sold to foreign banks and companies to enable developed countries to increase pollution.

Overall, Durban represents a major victory for many developed countries that are seeking to extend the dimly unsuccessful carbon markets of the Kyoto Protocol.

Adaptation

Durban helped to elaborate the Adaptation Framework established in Cancun, including the new Adaptation Committee. It established a process of technical work and workshops on loss and damage. It also created a process to support the adaptation activities of Least Developed Countries.



Unfortunately, at the same time there was no agreement on a ‘comprehensive work programme on agriculture in non-Annex I Parties under the Adaptation Framework’, despite a call by African ministers prior to the Durban meeting.

Rather, the outcome – mainly an offering of workshops and papers – reflects the progressive downgrading of expectations on adaptation. Among other things, developed countries continue to blur the distinction between adaptation and other development processes, so they can characterise Official Development Assistance (ODA) as adaptation finance and limit the scale of their financial commitments. At the same time, efforts continue to narrow funding only to ‘most vulnerable’ countries, rather than to all developing countries, in accordance with the Framework Convention.

Finance and technology

The talks agreed to operationalise the Green Climate Fund (GCF) but failed to make real progress on long-term finance or its sources. Durban, in other words, agreed to set up a bank, but the vault remains empty. The GCF outcome is a mixed bag, with major concerns especially over the role of the proposed private sector facility, the approval process involving ‘nationally designated authorities’, the role of the interim trustee and the criteria for selecting the permanent trustee.

Developed countries failed to commit to any specific level of finance for 2013, or on the level of public finance to be provided by 2020. This follows a poor performance in delivering the \$30 billion for 2010–2012 pledged in Copenhagen and Cancun, very little of which has been disbursed, and even less of which is genuinely new and additional.



In Durban, governments did agree to two finance work programmes, one on long-term finance (under the COP) and another on sources of finance (under the Standing Committee). These will provide an opportunity to continue to raise the importance of finance to any climate deal.

On technology, Durban offered a few small developments, including a call for proposals on the Climate Technology Centre and Network. Developed countries blocked any outcome relating to intellectual property controls or technology assessment.

Durban Platform for Enhanced Action

Under the Durban Platform for Enhanced Action, parties are to negotiate a new ‘Protocol, another legal instrument or agreed outcome with legal force’. This is to be agreed by 2015 and to come into effect by 2020.

The mandate for negotiations says the new agreement will be ‘under the Convention’ but a major fight has been brewing during 2012 over the scope of the new outcome. Many developed countries want a deal focused mainly on mitigation, with lip service being paid to issues important to developing countries, such as adaptation, finance and technology.

More problematically, the US sees Durban as a major success because there is no explicit reference in the Durban Platform to equity – providing scope for its outcome to be based on ‘legal symmetry’ among rich and poor countries, and obligations on developing countries that are not conditional on their receiving the finance and technology they need. It also involves what the US calls ‘modernisation’ of the Framework Convention, meaning no differentiation between developed and developing countries, excluding the Least Developed Countries.

Even if countries are successful in securing an outcome that is both ambitious and equitable – one that would necessarily exclude the US based on its current policy – then the delay in implementation until 2020 means that climate action will be far too late. Small islands and Least Developed Countries have emphasised the science that shows that global emissions must peak by 2015 to have any reasonable chance of keeping warming below 1.5°C.

Recognising this, the Durban Platform includes a process to close the ‘ambition gap’ with a view to ensuring the ‘highest possible mitigation efforts by all Parties’. The US has already said its own pledge is not up for review, and so increased political pressure will be required to ensure greater leadership by those countries most responsible for the climate crisis.

To secure success in future discussions, we must see the UNFCCC as only one battleground in a much larger struggle and scale-up efforts to pressure those countries and actors – including domestic special interests, elites and corporations – that are undermining progress.

Full original text available at: http://twinside.org.sg/title2/climate/pdf/assessments/Bonn09/Durban_Assessment_Bonn12_Version_Print1.pdf This extract language and copy edited.

Initial signatories: Asian Indigenous Women's Network (AIWN), Council of Canadians, Friends of the Earth EWN, Institute for Agriculture and Trade Policy (IATP), International-lawyers.org, Nord-Sud XXI, Jubilee South - Asia/Pacific Movement on Debt and Development, Pan African Climate Justice Alliance (PACJA), Tebtebba (Indigenous Peoples' International Centre for Policy Research and Education), Third World Network.

For a set of 'Climate Justice Briefs' and other material jointly issued by these and other climate justice oriented organisations see: <http://climate-justice.info/resources/cj-briefs-2/>



The facts: Weak ambitions and loopholes

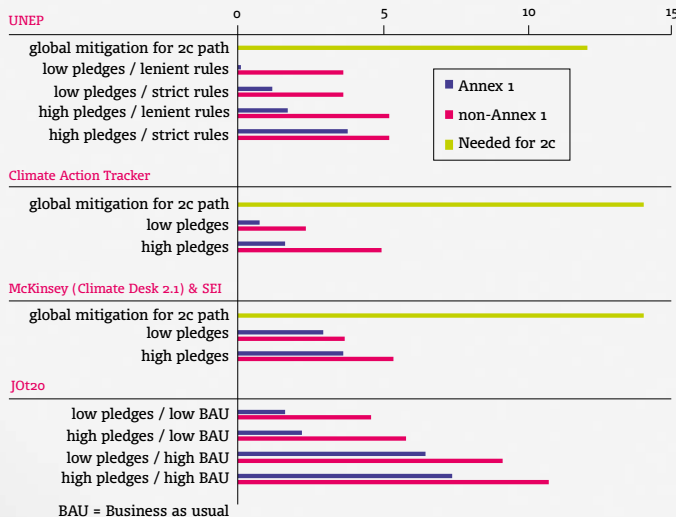
In the UNFCCC agreements made in Bali and Poznan, the Annex 1 countries were expected to agree, by March 2009, on a science-based aggregate target (at the time often assumed to lie in the range of 25-40 per cent emission reductions by 2020. In the remaining time leading up to the Copenhagen summit in December 2009, the countries would negotiate their respective legally binding commitments to ensure they jointly reached this agreed target – all so that the, legally binding figures could be enshrined in the second commitment period of the Kyoto Protocol in time for its starting date of 1 January 2013.

This never happened. The Annex 1 countries have refused to negotiate any real figures for emission reductions during the seven years of negotiations within the Kyoto Protocol. Instead, countries have ‘pledged’ their intentions, first through the Copenhagen Accord and later within the formal UNFCCC setting. However, there is no aggregate ambition to ensure these bottom-up pledges are in any way consistent with what is scientifically required.

Pledges

What do the pledges add up to, and how do the ambitions of Annex 1 and non-Annex 1 countries compare?

Figure 1: Pledged mitigation in 2020 – Annex 1 vs non-Annex 1 (GtCO₂eq)



Source: Kartha and Erickson, 2011

First, the pledges of Annex 1 countries only add up to between 12 and 18 per cent reductions by 2020 compared to 1990. The US pledges to reduce by only 4 per cent, while Canada is even intending to increase relative to its 1990 emission levels.

Second, the pledges of the rich countries amount to less mitigation than the pledges put forward by the developing countries. A meta-study by Stockholm Environment Institute reviewed four independent studies comparing Annex 1 and non-Annex 1 pledges, finding that across a wide range of methodologies and assumptions, all concluded the same: developing countries promise more!

Loopholes cancel out developed-country pledges

On top of the low pledges, Annex 1 countries also have a range of 'loopholes' to further weaken their commitments.

These accounting loopholes could more than negate the pledges of Annex I countries. Taken together, the loopholes will weaken the pledges by between 3 and 8 Gt CO₂ equivalents in 2020 (UNEP, 2010). If Annex 1 countries commit only to their lower ('unconditional') pledges, these loopholes would completely negate the pledged emission reductions. Even assuming the Annex 1 countries commit to their higher ('conditional') pledges, which are estimated at 3.8 Gt CO₂ e in 2020 (UNEP 2010), they could be negated and Annex I countries would even be able to increase their emissions (Figure 1). And if there were loopholes still left over, the Annex 1 countries could use them to undermine the environmental integrity of a third commitment period.

The size of these current loopholes is staggering. Strong action is required now to close the loopholes effectively and efficiently if we want to preserve the possibility of staying below a temperature rise of 2° or 1.5°C. None of the technical issues around the loopholes is insurmountable. If developed countries are serious about fulfilling their responsibility to lead the fight against climate change, they need to put ambitious targets on the table that are in line with the science and do away with loopholes. So far, however, hardly anything has been done in the negotiations to close these loopholes.

What are the key loopholes?

Loopholes are weak rules that undermine reduction targets. Usually these weak rules are the result of political bargaining.

The largest loopholes are:

- » The carry-over of 'hot air' due to the overallocation of carbon trading emissions credits during the first commitment period.
- » Creation of new 'hot air' post-2012 due to weak targets.
- » 'Creative' accounting rules for land use, land use change and forestry ('LULUCF') for A1 countries.
- » CDM credits from projects that are either overcredited or not additional (that is, they would have been carried out anyway and thus cause no reductions).
- » Double counting – attributing emission reductions to both developed and developing countries.
- » Emissions from aviation and shipping ('bunkers') currently not accounted for under the Kyoto Protocol.

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India and Africa at COP 17 – The false dichotomy of 'survival vs. development'

Sivan Kartha

In Cancun, India was hailed for helping to bridge differences between rich and poor countries. But at COP 17, India's stance on not agreeing to a mandate for a new legally binding treaty to replace the Kyoto Protocol and the Bali Action Plan drew strong criticism, with some arguing that India's insistence on its 'right to development' was a betrayal of poorer countries and even a threat to their survival.

The common wisdom is that we've come here to save Africa. Africa, we hear every day, is a continent populated with poor people on the front lines of climate change, where immediate adaptation is a priority and climate delay means death. India, we hear, is the grim reaper. And the purpose of COP 17 is, in large part, to compel India to step back from the brink and help save Africa. India should stop being an obstructionist and come to the rescue of Africa.

Well...some comparisons are in order.

Africa is poor. Very poor. Seventeen Africans live on the income of one American. And India? Turns out the number of Indians who live on the income of one American is...16. Yes, India is a bit closer to Africa than it is to the United States on this score.

But, even though India's average income is just about the same as Africa's, India is still crawling with millionaires like Mukesh Ambani, right? Actually, 1.1 per cent of Africans have made it into the top global wealth decile, whereas 0.9 per cent of Indians have. Rather even, I'd say. And again, India stands a bit closer to Africa than to the US (with 21 per cent of Americans in the top global decile).

India's environment minister, Jayanthi Natarajan, was widely criticised for her tough stance.

But, anyway, Africa is a low emitter, which is suffering from the rest of the world's emissions, whereas India is on a planet-incinerating

coal binge, right? After all, an African's per capita greenhouse gas emissions are only one-sixth of an American's. And India? Well...only one-tenth of an American's, actually. And, if you don't like per capita comparisons (you don't think India should get a break for being populous?), India's total emissions are only two-thirds of Africa's.

As for vulnerability, where does India's water come from? From the Himalayan glaciers and from the monsoons. My guess is climate change will be no kinder to India than to Africa.

Of course, the point of this is not to compare Africa and India so we can figure out who is poorer, who is suffering more, and who is less responsible for climate change. The point is to ask, why have so many people got sucked into the India scapegoating, which is so obviously a diversion? The whole 'survival versus development' false dichotomy has always been dangerous, but never more so than when applied to Africa and India. It is no surprise India appears to some to have gone on the defensive, dug in its heels, and started looking for allies wherever it can possibly find them. Which, alas - but unsurprisingly - has led it to engage in some ham-handed diplomacy.

In these negotiations, we've got to turn our attention back to the Parties who are the real blockers...the greedy Parties that are demanding every loophole; the free-riders who are putting forward paltry pledges that are completely at odds with their capacity and responsibility; the tight-fisted countries that are still refusing to put real money on the table to help stop climate catastrophe, ostensibly because of their self-inflicted financial woes.

Shall we focus on the real problems and get back to work?



Climate finance

– How much is needed?

Matthew Stilwell

Curbing climate change and coping with its adverse effects will require a major scaling-up of climate finance. UNFCCC Parties have recognised this need agreeing to ‘urgently enhance implementation of the Convention in order to achieve its ultimate objective in full accordance with its principles and commitments’ (UNFCCC, 2007a). To address this challenge in practice Parties must address the scale and sources of financing and find better ways to disburse and account for it.

The Convention requires the Conference of Parties and the ‘entity or entities entrusted with the operation of the financial mechanism’ (for example, the new Green Climate Fund) to identify the scale of financing that is ‘necessary...for the implementation of this Convention’ (UNFCCC, 1992). Yet, very few of the estimates offered so far provide comprehensive estimates of the funding needed to implement the Convention.

The UNFCCC Secretariat analysis, for example, suggests that adaptation costs in 2030 could be US\$49–71 billion per year globally, of which US\$27–66 billion would be required in developing countries (UNFCCC, 2007b). A recent review of the UNFCCC study suggests actual costs could be up to three times higher for the sectors covered in the study and ‘much more if other sectors are included’ (Parry et al, 2009).

The costs of adverse effects from climate change are real, they are explicitly referred to in the Convention and they can and should be added to estimates relating to ‘adaptation’. The World Bank’s own studies, for example, indicate that two degrees of warming could result in permanent losses of GDP in South Asia of 5 per cent (World Bank, 2009); sea level rise could cause losses of 38.4 per cent of GDP in some coastal areas (Dasgupta et al, 2009:25); and some countries will be so heavily impacted by sea level rise ‘that their national integrity will be affected’ (Dasgupta et al, 2009:44).

Other studies confirm levels of costs and damage that exceed current estimates by the World Bank, UNFCCC and other studies – in some cases by one order of magnitude or more. In terms of adaptation costs:



EJP Photo

Costs in terms of future loss potential 'of a strong hurricane in New York would escalate ... to US\$ 5.43 trillion'

- » The Global Humanitarian Forum, headed by Kofi Annan, 'estimates future economic losses could amount to more than US\$340 billion by 2030 (only 30 countries in the world currently have a GDP higher than this number)' (GHF, 2009: 20). The same study states: 'The carbon dioxide emitted globally in 2004, for example, carries a social cost [i.e. net present value of future impacts] of over US\$1300 billion, a figure greater than 2 per cent of global GDP in 2008 (GHF, 2009: 44).
- » The Imperial College London and International Institute for Environment and Development study reviewing the UNFCCC Secretariat analysis (noted above) points to costs of adaptation exceeding US\$500 billion a year if UNFCCC Secretariat analysis is updated to include a fuller evaluation for covered sectors, additional cost for sectors not covered by the analysis, as well as costs for damage to ecosystem services and residual damage relating to extreme weather events (Parry et al, 2009; Kanter, 2009).
- » Allianz insurance company and WWF, in their study entitled 'Major Tipping Points in the Earth's Climate System and Consequences for the Insurance Sector', estimate that:
 - Costs in terms of future loss potential 'of a strong hurricane in New York would escalate...to US\$5.43 trillion' (WWF and Allianz SE, 2009:37) and, as a result, 'economic development in such a hazardous zone has to be questioned' (WWF and Allianz SE, 2009: 38).
 - Die-back of the Amazon forest which releases carbon dioxide and 'occurs between 1 and 2°C results in incremental NPV [net present value] costs of carbon approaching US\$3,000 billion and ... policies aimed at stabilization at 2°C result in NPV costs of the order of US\$3,000 billion from carbon lost through die-back of the Amazon alone' (WWF and Allianz SE, 2009:56)
 - Global sea level rise 'of 0.5 m by 2050 is estimated to increase the value of assets exposed in all 136 port megacities worldwide by a total of US\$25,158 billion to US\$28,213 billion in 2050' (WWF and Allianz SE, 2009:30).

The potential for non-linear and spiralling climate impacts and costs is not well addressed either in current climate models (which regularly underestimate climate feedbacks) or in estimates of adaptation costs (which, excepting a few studies, have underestimated or excluded the costs of adverse impacts and have not addressed tipping points and other non-linear changes), meaning expected loss and damage, and associated costs, are underestimated.



World military spending exceeds US\$1.5 trillion annually,

Similarly, studies of mitigation costs often fail to take into account the latest scientific information about the scale of committed warming, or fail to adopt equitable assumptions about how the costs will be distributed between developed and developing countries, or assume an inadequate scale of global emissions reductions and therefore understate the costs of limiting warming (for example, they assume a 450 ppm pathway, which is now understood to risk catastrophic impacts).¹

The existing models for calculating finance need to be recalibrated and the scale and sequencing of financing for mitigation and adaptation needs to be rethought, with much larger investments made earlier. Growing impacts worldwide provide a warning beacon signalling the need for more ambitious and early action on both mitigation and adaptation.

If UNFCCC Parties are serious about curbing climate change, and achieving the objectives of the Convention, then much larger levels of financing than currently under consideration (that is, in the trillions) must be taken seriously. This is particularly true in light of emerging science regarding levels of committed warming and the potential for non-linear effects and tipping points.

Financing in this order seems high when evaluated against ODA and other traditional development-related expenditures. Finance demands for climate change, however, are modest when viewed as an investment in maintaining the stability of the Earth's life support system, or when compared against the likely costs of inaction, or the sums spent on other issues such as the global financial crisis or military conflicts. For example:

- » In response to the global financial crisis, central banks in the European Union and the United States purchased US\$2.5 trillion in debt; they raised capital of national banking systems by US\$1.5 trillion (Altman, 2008); and the United States executed two stimulus packages totalling almost US\$1 trillion (BBC, 2010).
- » In prosecuting wars in Iraq and Afghanistan, the United States has allocated around US\$1.09 trillion (Dagget, 2010). The wider costs of the Iraq war to the United States (not to Iraq and the rest of the world) is estimated to be in the order of US\$3 trillion (Edemariam, 2008).
- » World military spending exceeds US\$1.5 trillion annually, with the United States spending around US\$660 billion (4.3 per cent GDP),

¹ For example, the International Energy Agency confirms that by 2017 the building of infrastructure will 'lock in' the whole remaining carbon budget for 2°C 'leaving no room for additional power plants, factories and other infrastructure unless they are zero-carbon, which would be extremely costly'. Accordingly 'delaying action is a false economy: for every US\$1 of investment avoided in the power sector before 2020 an additional US\$4.3 would need to be spent after 2020 to compensate for the increased emissions.' See, *World Energy Outlook 2011* (IEA, 2011).

China US\$98 billion (2 per cent GDP), United Kingdom US\$69 billion (2.5 per cent GDP), France US\$67 billion (2.3 per cent GDP), Russian Federation US\$61 billion (3.5 per cent GDP), Germany US\$48 billion (1.3 per cent GDP), and Japan US\$47 billion (0.9 per cent GDP) (SIPRI, 2011; Wikipedia, 2011).

The demand by the G77 and China for annual financing equivalent to at least 1.5 per cent of Annex I GDP (roughly US\$600 billion) is approaching the order of financing required. The African Group's demand in Copenhagen for financing equivalent to at least 5 per cent of Annex I GDP (roughly US\$2 trillion), and Bolivia's demand for at least 6 per cent (roughly US\$2.4 trillion), may ultimately prove more realistic estimates of costs when both mitigation and adaptation are considered in light of the latest scientific evidence on climate change, and the need for an ambitious global effort to avert non-linear changes and hold warming to levels that are safe for developing countries. Given the uncertainty surrounding climate change, developing countries should avoid locking in a sum for long-term financing (for example, by 2020) that provides a 'ceiling' rather than a 'floor' for future levels of financial resources.

The challenge for Parties going forward is how to progressively raise the level of ambition on financing and to close the financing gap, to ensure that the aggregate level of new and additional resources measures up to the yardstick of funding that is needed to implement the Convention and address climate change.

The responsibility for meeting financial commitments under the Convention lies squarely with the developed countries listed in its Annex II. Yet, the pledge by developed countries is to 'mobilise' US\$100 billion offers a start, but it guarantees neither the provision of any specific level of public funding (it refers to a 'wide variety of sources') nor that the funding will be provided by the developed countries (they have merely committed to 'mobilise' it). Additionally, US\$100 billion falls well short of any reasonable science- and economic-based estimates of the level of financing required to implement the Convention.

A first step in scaling up finance is ensuring that financial contributions by developed countries occur in practice and not merely on paper. Consequently, the Convention requires financial contributions to be new and additional. Developing modalities for evaluating whether financing is new and additional is a priority, particularly in light of the fact that emerging information suggests that a substantial proportion of 'pledged' finance was

pledged previously (and so is not ‘new’) or will be counted towards ODA commitments (and so is not ‘additional’).²

Ultimately, the provision of assessed contributions drawing on both traditional public sources and ‘innovative sources’ (for example ‘special drawing rights’, such as those created by the IMF to provide international reserve assets to address the global financial crisis) will be required as part of the major effort to scale up financial resources in order to cope with the adverse effects of committed climate change, and to curb emissions by 2015 or 2020 and avoid further dangerous interference with the climate system.

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² See, e.g., African Climate Policy Center (2011), *Fast-Start Finance: Lessons for Long-term Climate Finance under the UNFCCC*, indicating that between US\$2.8bn and US\$7.0bn (out of the US\$29.2bn pledged) of the fast-start finance is ‘new’, and figures up to early September 2011 indicate that less than US\$3bn are ‘additional’ to ODA commitments. By this standard, less than one-tenth of the US\$30 billion pledged is ‘new and additional’.

China and climate change – Spin, facts and realpolitik

Dale Jiajun Wen

With its growing economy, China is becoming increasingly important on the international scene. The issue of climate change is no exception. Many Western colleagues have said that nowadays it is almost impossible to have a discussion about climate change without someone referring to China. Yet there is plenty of misinformation and spin about China's actions and positions on climate change, which are often counter-productive; and the dynamics at play within China are largely unknown to outsiders. It is crucial to engage with China in a more constructive way. This article attempts to debunk some common misinformation and spin by examining facts about China's existing actions and positions. It also analyses China's internal politics and its interaction with international climate politics.

China is serious about climate change – how about the West?

'How serious is Europe about climate change? We are having black-outs in some places in order to make the energy conservation targets. Are any European countries taking comparable measures in order to reach their Kyoto targets?' When I talked with a senior energy official from China during the summer of 2009, this was the question he asked me. He did not ask about the USA, because as climate insiders, we both knew that even under the best circumstances, it would take years for the United States to catch up and undertake comparable efforts. So he only asked about Europe, the supposed climate leader in the world.

To be honest, his question jolted me. From an environmental point of view, I had always argued that China was not doing enough to address its vast ecological challenges including climate change (Wen, 2009), a point I will elaborate further. Yet I had to concede to him that China is already doing a lot. If we use the West as the benchmark, there are few grounds for asking China to do more.



Karl Krüg

Shanghai, China,
August 30, 2007



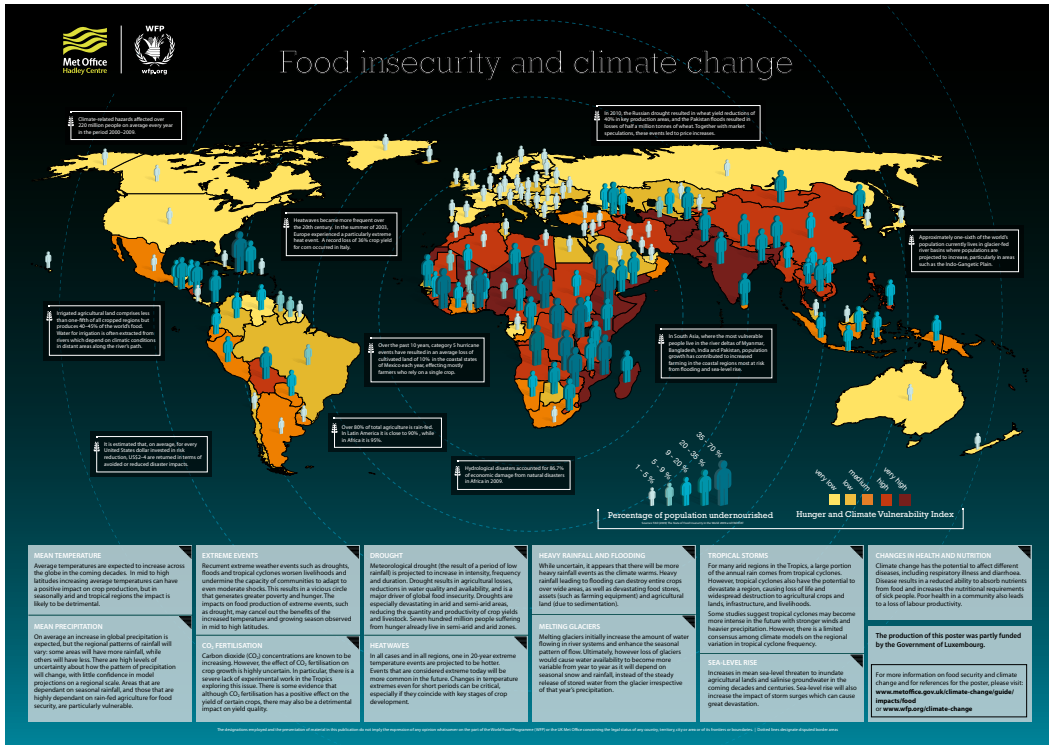
More than one young Chinese activist seemed to now see some truth in the claims that the West is trying to use climate change to constrain the growth of China and other developing countries, as argued by some Chinese climate sceptics whom they used to disregard.

The unfortunate consequence of Copenhagen

Yet, during and in the aftermath of Copenhagen (and Cancun and Durban), China's ongoing efforts have largely been treated as non-existent (China's 2020 40–45 per cent carbon intensity target was erroneously dismissed as 'business as usual'), and China was blamed big time for the failure of the negotiations. I already started to sense the damage in Copenhagen's Bella Center while the negotiations were still ongoing, when more than one young Chinese activist expressed their confusion to me. They had campaigned for years to push China to go low-carbon and make more ambitious efforts, yet COP-15 was their first time of witnessing international negotiations at play and it shattered their conviction. They seemed to now see some truth in the claims that the West is trying to use climate change to constrain the growth of China and other developing countries, as argued by some Chinese climate sceptics whom they used to disregard. Had they been misled or even cheated? Was their work wrong? I tried my best to console them: 'No – no matter how bad the politics is, the climate science is still sound. Your previous work might be one-sided or incomplete, but not wrong at all. Now that you realise the double standard and bigotry in certain parts of the environmental movement, you just have to expand your previous work to confront that as well.'

Things went from bad to worse. The UK climate secretary, Ed Miliband, led the charge (see Vidal, 2009), accusing China of trying to hijack the Copenhagen climate deal, followed by Mark Lynas's inflammatory account, 'How do I know China wrecked the Copenhagen deal? I was in the room' (Lynas, 2009), published in *The Guardian* soon after the meeting. This was probably the most widely read report about the summit failure.

Copenhagen achieved one thing in China, as in many other parts of the world: it popularised the topic of climate change. Before, the subject was only discussed in depth among the experts and within environmental circles, while the general population only knew a few superficial buzzwords. Afterwards, it became a rather commonly discussed topic. Unfortunately, for most newcomers to the conversation, their entry point was the massive China-bashing associated with it. Thus, their main concern has become how China can defend itself against this so-called Western conspiracy. One deeply worrying, yet common response was, 'Let's unite with the US right wing to destroy the stupid European climate agenda.' Needless to say, this knee-jerk response is wrong in every respect, but this does not change the sad fact that people like Mark Lynas and Ed Miliband have probably done more to discredit the concern for climate change among the Chinese population than all of the Western climate-change sceptics combined.



Above: A poster map designed by World Food Programme and UK Met Office Hadley Centre weaves together the latest information on climate change and food insecurity to show how the two are related. The darker the red, the more vulnerable countries are. The map can be found at: <http://documents.wfp.org/stellent/groups/public/documents/newsroom/wfp229182.pdf>

The Chinese government tried, clumsily, to control the negative messaging and limit the damage, stating that Copenhagen had been a success, not least due to China’s constructive participation. With many Chinese directly following English-speaking media nowadays, such a cover-up did more harm than good. Within months, articles and books were published to disclose the Western ‘low-carbon plot’. In Baidu Baike, the Chinese version of Wikipedia, today there is even an entry called ‘low carbon conspiracy’,¹ which argues that Western governments are using low carbon as a tool to undermine developing countries, and which cites published articles and books as references. Years of hard work by Chinese environmentalists and progressive segments of the government are being undermined.

Set the record straight: China's position and actions

To understand the Chinese response to the China-bashing after Copenhagen, let us examine the statistics and facts in a systematic way. After Copenhagen, China has been accused of having an ‘aversion to arithmetic’ (The Economist, 2009). But when one does the maths, the numbers tell a different story.

1 See <http://baike.baidu.com/view/3637204.htm>



This is the sad reality of the climate negotiations: developed countries try to escape their historical responsibility and continue to occupy a disproportionately large share of what remains, while developing countries including China are being blamed for resisting such an unfair deal.

At Copenhagen, developed countries proposed a global emission-reduction goal of 50 per cent – and 80 per cent for themselves – by 2050 compared to 1990. China’s reported big sin for sinking Copenhagen was to refuse this seemingly generous proposal. Why? Because the offer is not so pretty when you do the numbers. As pointed out by Martin Khor, director of South Center: ‘[I]t implies that developing countries would have to cut their emissions overall by about 20 per cent in absolute terms and at least 60 per cent in per capita terms. By 2050, developed countries with high per capita emissions – such as the US – would be allowed to have two to five times higher per capita emission levels than developing countries’ (Khor, 2009). Dennis Pamlin, former global policy advisor for WWF reached a similar conclusion. With the assumption that 80 per cent of the 80 per cent reduction will be done domestically in Annex 1 countries, while the rest is done through international offsets (like the Clean Development Mechanism (CDM)), one can calculate that ‘this would give the rich countries three times [the] emissions per capita compared with developing countries (3.7 tonnes per capita compared with 1.25 tonnes per capita)’ (Pamlin, undated). So even if we ignore cumulative, historical emissions, which is important in relation to equity, this seemingly generous offer by the developed countries actually locks in their already unfairly large share of the remaining atmospheric space.

The author of the famous Stern Report, Sir Nicholas Stern, admits: ‘In the case of the...“contents of the atmosphere” it is hard to think of an argument as to why rich people should have more of this shared resource than poor people. They are not exchanging their labor for somebody else’s and they are not consuming the proceeds of their own land, or some natural resource that lies beneath it’ (Stern, 2010: 30). Yet this is the sad reality of the climate negotiations: developed countries try to escape their historical responsibility and continue to occupy a disproportionately large share of what remains, while developing countries including China are being blamed for resisting such an unfair deal.

Another common, yet misleading, narrative in climate politics is the ‘G2 narrative’: the US versus China. The US has persistently used China as its excuse for inaction and the need for a new paradigm to replace the Kyoto Protocol. The majority of the Western press also portrays the so-called US-China impasse as one of most serious roadblocks to a global deal. Is that so? In an open letter to Todd Stern, US special envoy on climate change, sent at the time of the United Nations climate negotiations in Tianjin, China, in October 2010, a number of Chinese academics and green groups set the record straight with the following facts:²

² This open letter can be downloaded at http://www.foe.co.uk/resource/letters/china_letter_us_negotiators.pdf. The references in footnotes 3-9 below are those given in the open letter.

- » China has experienced a recent economic boom, but it remains fundamentally a developing country. More than 40 per cent of the population has no access to improved sanitation, and 18 per cent of the rural population has no access to improved drinking water sources.³ Yet, China is not shying away from its responsibility to address climate change. Indeed, its efforts compare favourably with those of the United States, given their relative contributions to climate change.
- » The United States has been and remains the world's largest contributor to climate change. With less than 5 per cent of the global population the US has been responsible for 29 per cent of the global cumulative emissions (between 1850 and 2006) that are causing climate change; China, with 20–22 per cent of the global population, accounts for a mere 8.62 per cent of emissions.⁴
- » Today, on average, citizens of the United States continue to pollute about four times as much as people in China – 19.2 versus 4.9 metric tonnes per capita in 2008.⁵
- » China set up a comprehensive National Climate Action Program in 2007; the United States still has no comprehensive national climate legislation.
- » China's vehicle fuel efficiency standards are more stringent than those in the United States, with 34 and 27 miles per gallon respectively.⁶
- » China's investment in clean energy dwarfs that of the United States. In 2009, China invested US\$34.6 billion in clean energy (or 0.39 per cent of its GDP), while the United States only put in US\$18.6 billion (or 0.13 per cent of its GDP).⁷
- » In recent years, while closing thousands of small inefficient coal-fired plants and iron-smelting facilities, China has doubled its newly installed wind capacity every year, and its solar PV production and newly-installed capacity has grown 240 per cent and 37

3 WHO/Unicef, Joint Monitoring Programme (JMP) for Water Supply and Sanitation. See [http://www.wssinfo.org/documents-links/documents/?tx_displaycontroller\[type\]=country_files](http://www.wssinfo.org/documents-links/documents/?tx_displaycontroller[type]=country_files)

4 Cumulative emission data was calculated by the World Resources Institute (WRI) (2012) Carbon Analysis Indicator Tools (<http://cait.wri.org/>).

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7 PEW Charitable Trusts (2010), Who's Winning the Clean Energy Race? Growth, Competition, and Opportunity in the World's Largest Economies, Philadelphia PA: Pew Charitable Trusts. http://www.pewtrusts.org/uploadedFiles/wwwpewtrusts.org/Reports/Global_warming/G-20%20Report.pdf

per cent annually.⁸ The growth rate of renewable energy in the United States is significantly below China's.

- » China pledged to reduce emissions intensity by 40–45 per cent by 2020 in comparison to 2005, whereas the US pledged to reduce emissions by 17 per cent in the same time period. According to a UNFCCC analysis,⁹ the US pledge translates to approximately 0.8 gigaton (Gt) CO₂ of effort in 2020, while China's pledge is calculated to amount to approximately 2.5 Gt CO₂, or approximately three times the United States' effort.

The same Chinese academics went on to debunk the G2 narrative used by the US:

...China is not and must not continue to serve as an excuse for continued inaction by the United States, especially as China is moving forward with serious efforts. The United States, as the world's richest country and its greatest historical polluter, must fulfill its obligations under the UNFCCC and Bali Action Plan. We call upon the United States to respect and contribute to the UN process, instead of undermining it and becoming a shield for other Annex I countries to hide behind.

Finally, they put forward a challenge to the US:

[W]e call on the United States to deliver in the next five years, the growth in renewable energy production which China brought into being in the last five years: double newly-installed wind capacity every year, match the high growth rate for solar as well. The United States has many technologies and options at its disposal and given its status as the world's richest nation, it should at least match China's efforts, and do much more. The aforementioned challenge, therefore, is our call to the US Government.

China's climate actions between 2006 and 2010

During and after Copenhagen China was criticised for announcing that the 2020 target was merely business as usual. With the trend of decreasing carbon intensity shown in the previous few years, a 40–45 per cent intensity reduction by 2020 could be easily achieved without serious efforts. This is far from the truth.

8 Data from 'The Renewable Energy Industrial Development Report 2009' (China) and Global Wind Energy Council.

9 This estimate was calculated by the UNFCCC Secretariat and documented in their Preliminary Assessment of pledges made by Annex 1 Parties and voluntary actions and policy goals by a number of non-Annex 1 Parties. (This leaked document was widely circulated, and made available at, for example, http://graphics8.nytimes.com/packages/pdf/science/17dotearth_3degrees.pdf).

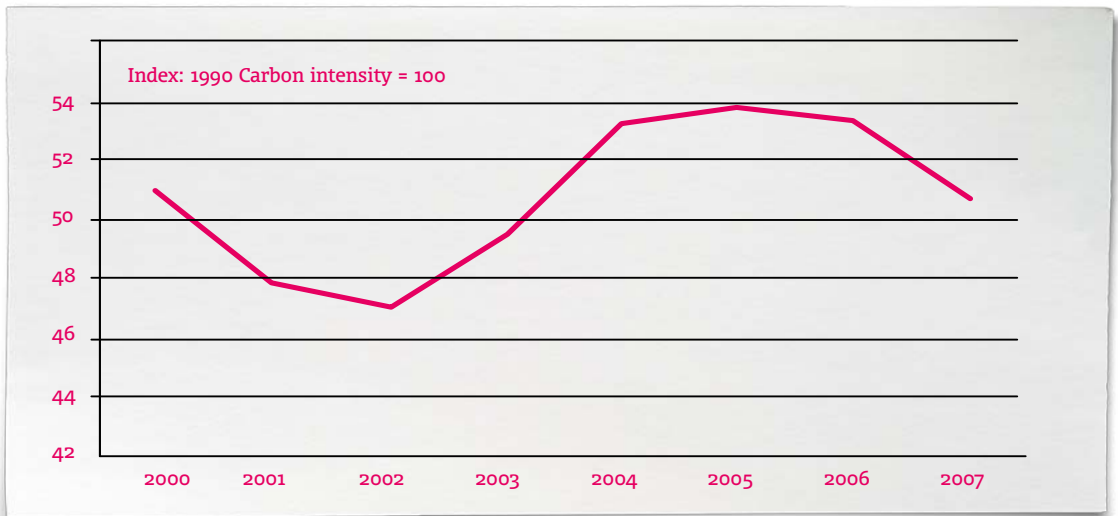


Figure 1: China's carbon intensity change in the last decade. Source: International Energy Agency, Paris, 2009.

2002-2005: average 2 per cent annual growth of carbon intensity
 2005-2006: 1.79 per cent decrease
 2006-2007: 4.04 per cent decrease
 2007-2008: 4.59 per cent decrease¹⁰

Alarmed by the rapid rise of carbon emissions and especially the intensity rise starting from the turn of the century, the Chinese government adopted a 20 per cent energy intensity reduction target for the 11th five-year plan (2006–2010) – an ambitious figure compared to other countries. Efficiency and conservation targets were then set for each municipal level as well as for certain sectors on a yearly basis. In some places, large factories were shut down for a few weeks, to reach the target; and in some extreme cases, even residential areas experienced blackouts. So far, there is probably no example in Europe or any other industrial country that comes close to such draconian measures. While it is debatable whether such harsh measures are necessary, or the best way to achieve results, they show China's resolve to strive for its targets, even though these are only domestic targets, without any international obligation or pressure to deliver. The decreasing carbon intensity we have seen since 2005 is largely due to these efforts, and labelling them 'business as usual' would seem to penalise early movers.

One measure undertaken by the Chinese government was to close down inefficient facilities including power generation units, iron-smelting, steel-making, cement production and other energy-intensive facilities. For example, from 2006 to mid-2009, it closed down small inefficient thermo-power plants with a total of 54.07 GW generating capacity, thus surpassing the 50 GW goal set for the 11th five-year

¹⁰ Graph and data from Chandler and Yanjia (2009).

plan. From an economic and carbon point of view, such measures are low-hanging fruits that all countries (both developed and developing countries) should undertake as soon as possible: the cost is estimated to be recovered in, at most, 4.5 years due to the increased efficiency and the amount of coal that is being saved. But even such 'no-regret' measures are not without pain: it is estimated that about 400,000 jobs were eliminated. State-owned enterprises had to step in to retrain and help at least 260,000 people to find employment again.

Renewable energy also experienced massive growth. The most salient sector is wind. There was more than 100 per cent annual growth on average in wind power between 2005 and 2010. In 2005, China set two wind power goals – 5 GW by 2010 and 30 GW by 2020 – but it has consistently outpaced them. 500 MW of new wind capacity was installed in 2005. The pace of installation accelerated considerably in 2006, with 1.3 GW installed – equal to the total over the previous two decades. By 2007, China had already reached 5 GW, and raised its 2010 target to 10 GW and its 2020 target to 100 GW. A total capacity of 42.29 GW was installed in 2010, the highest in the world.

The massive growth of wind power installations is partly due to proper policies which have led to huge cost reductions, making wind energy much more affordable. Cost used to be high because of high import cost. To encourage technology domestication, a new bidding process was introduced in 2006: turbines with domestic content above 70 per cent can apply for a subsidy of 600 Yuan per kW. It was designed to help producers overcome the entry barrier, but was not intended as a permanent subsidy: for each producer, only a maximum of 50 sets could enjoy this subsidy. Between 2006 and 2010, wind turbine cost per kW installation decreased from around 8000 Yuan to 3000 Yuan¹¹ (US\$1=6.5 Yuan). Unfortunately, this apparently rather effective policy was scrapped in July 2011 under US pressure, as the US filed a WTO case against China, claiming that the policies were incompatible with WTO rules.

Not limited to wind, a whole range of China's renewable energy policies are under attack. On 9 September 2010, the biggest union in the United States, United Steelworkers, filed a 5,800-page petition under Section 301 of the Trade Act of 1974, alleging that the Chinese government had violated international trade laws by providing hundreds of billions of dollars in illegal subsidies to its green-technology producers

11 Conversation with a Chinese wind industry insider in October 2011.

and exporters. On 15 October 2010, Barack Obama's administration announced the launch of a probe into the complaints, and WTO complaints were consequently filed against China. A friend from the United States commented that China is cornered into an impossible position: 'Either the Chinese don't take action on climate and we threaten to slap a BTA [border tax adjustment] on your imports, or take action and we challenge your support of green tech.' She is right on the mark. Indeed, if China is blamed no matter what it does on climate, what better evidence is there to convince people that climate change is merely a Western conspiracy to constrain the growth of developing countries?

Still, is China doing enough?

Do these statistics and facts imply that China is doing enough to address climate change and its vast ecological challenges? Hardly.

Yes, as a developing country, China is already doing more than the US, as well as more than the Annex 1 countries on average. But still, particularly when one looks beyond narrow carbon emission issues, a whole rethinking of the current development paradigm is certainly needed.

More than 50 per cent of oil and 20 per cent of gas consumption in China depends on import. The known coal reserves will be exhausted in 41 years with the current level of consumption (Pan, 2010) – three times faster than the average estimate for the world. If coal consumption grows at 7 per cent annually (roughly the current rate), it will be exhausted in less than 20 years.¹² Zhou Dadi, a senior policy adviser and former director of the Energy Research Institute of NDRC (National Development and Reform Commission), once said 'High carbon development will kill itself'.¹³ He means it literally.

Yet it is hard to get the message across to the general public, as they are bombarded with messages about glamorous consumer lifestyles. 'The most toxic export of the US is our wasteful way of production and consumption,' says Annie Leonard, maker of 'The Story of Stuff,' a sharp yet funny video critique of the overstuffed life.¹⁴ Unfortunately, this US export is spectacularly successful in China, with the emerging middle class thinking, 'Americans have it; now it is our turn.' In an article titled 'The north is forcing the south to repeat its mistakes,' Gao Feng,



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¹² Calculation based on above numbers.

¹³ Reported in blogpost 'Lord Nicholas Stern and WRI China Country Director Zou Ji Host Joint Seminar on Climate Change in Beijing', 9 April 2010. <http://www.chinafaqs.org/blog-posts/lord-nicholas-stern-and-wri-china-country-director-zou-ji-host-joint-seminar-climate-chan>

¹⁴ See www.storyofstuff.org

China's chief negotiator between 2000 and 2005, recounted a telling story: 'Years ago a now-retired senior German official became agitated when I remarked that if the Chinese wanted to combat climate change, his country's car manufacturers could go home and the Chinese could return to their bicycles. This would not do, he said, the Chinese should keep buying cars, but only drive them once a week' (Feng, 2008) Indeed, China's middle-class is buying cars in great numbers – China has recently surpassed the United States as the world number one automobile consumer; and as in the US, SUVs are quite popular among car-buyers.

Yet, attaining the Western consumerist lifestyle for the Chinese population at large is simply physically impossible. Taking into consideration both the ecological footprint and the available biocapacity, we would need 1.12 Earths if every Chinese were to achieve the present American lifestyle with the current level of technology.¹⁵ Globally, we are already overshooting hugely. The global ecological footprint exceeded one Earth in the 1980s and has increased steadily to about 1.5 Earths today. Needless to say, we only have one planet and we are liquidating its natural capital rather fast.

For China, the situation is particularly worrying when one considers agriculture. Even today, China is more than 95 per cent self-sufficient when it comes to major grains (rice, wheat and corn), but it uses about one-third of the world's chemical fertilisers to achieve that (Fang et al., 2011). Needless to say, there is a huge environmental and health toll associated with this unsustainable farming system. Guangdong province, the engine of China's export-oriented growth and the envy of many other provinces, only produces about 40 per cent of the grains needed for its population, while the rest has to be brought in from other provinces. Rice traded on the international market accounts for less than 20 per cent of China's consumption. Thus, if the whole of China became like Guangdong, not only would the international grain price go through the roof, but also the international market would not be big enough to serve China. In the light of these issues, it is high time for China to rethink its growth paradigm and address its rural-urban imbalances.

Importantly, climate change is already a growing threat to China's vulnerable agriculture sector.

¹⁵ Calculated with data from WWF et al. (2006).

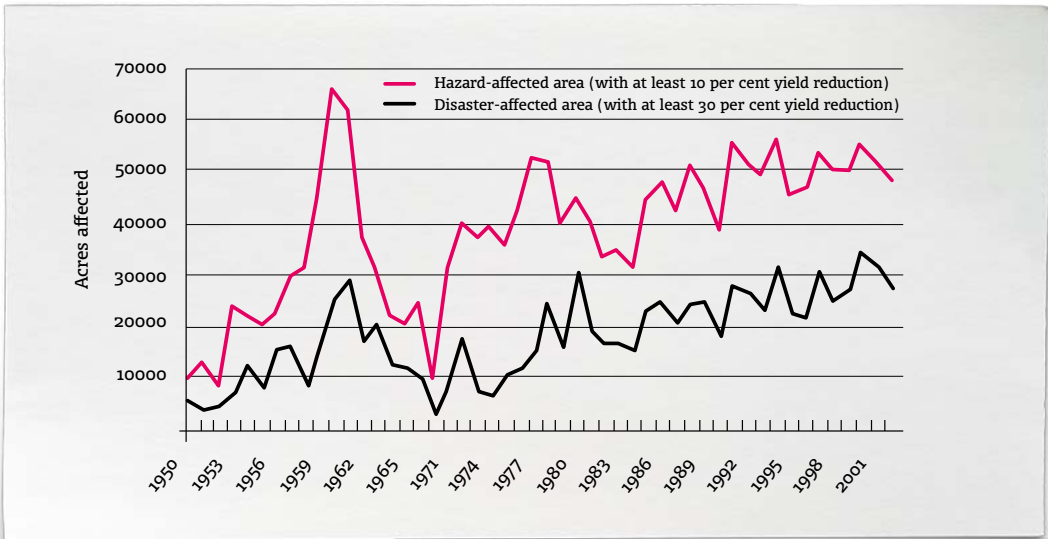


Figure 2: Hazard-affected areas (with at least 10 per cent yield reduction due to floods, droughts and other extreme weather conditions) and disaster-affected areas.

Source: Lin Erda, Chinese Academy of Agricultural Sciences

As shown in the above graph, coupled with temperature rise, the acreage of hazard-affected areas (with at least 10 per cent yield reduction due to floods, droughts and other extreme weather conditions) and disaster-affected areas (with at least 30 per cent yield reduction) has been increasing steadily since 1950. Between 1988 and 2004, it is estimated that, on average, droughts and floods resulted, respectively in 75.69 billion Yuan and 51.16 billion Yuan of damage, corresponding to 1.2 per cent and 0.8 per cent of GDP respectively.¹⁶ The rise in frequency and intensity of extreme weather conditions has been especially salient in the past few years. For example, Yunnan province has been in serious trouble for several consecutive years owing to drought and low rainfall. In the spring of 2012, 273 rivers and 413 small reservoirs dried up, leaving 3.19 million people and 1.58 million head of livestock short of drinking water (Xinhua, 2012a). While agriculture and rural areas bear the brunt of climate change, even big cities with fairly good infrastructure are not immune. On 21 July 2012, Beijing got over 200 mm of rainfall within 12 hours – more than one-third its normal annual rainfall. The unprecedented floods resulted in a few dozen deaths.

In December 2010, the UN World Food Program released a food insecurity and climate change map as input to the Cancun climate negotiations (WFP et al., 2010). It assigns a hunger and climate vulnerability index to each country according to its probability of food insecurity due to climate change. Of the five levels of ratings (very low, low, medium, high and very high), China's rating is 'high'.

¹⁶ Graph and data from a PowerPoint presentation by Professor Lin Erda, chief scientist at the Agro-Environment and Sustainable Development Institute, Chinese Academy of Agricultural Sciences.

Evidently aware of the threat and the precarious state of its agriculture sector, the Chinese government announced in early 2011 the plan to invest 4 trillion Yuan (more than US\$600 billion) in irrigation and rural water works by 2020 (Xinhua, 2012b).

Competing views within China

Just like any other government, the Chinese government is not a uniform entity. On the issue of climate change, there are competing views, corresponding to the diverging views also found within academia and among the public.

For many experts working on energy issues, agricultural issues or environmental issues in general, there are evident limits and constraints on growth, both physical and biological. They realise there is no way one can negotiate with this fact, and thus argue that promotion of technology advancements, such as a transition to renewable energy and efficiency improvement should be rolled out as fast as possible. Some even go one step further to argue that the growth paradigm as such has to be challenged and changed. For many of them, constraints posed by an international regime such as the UN climate negotiations can be well accepted if it is seen as fair and science-based.

With most of China's top leadership coming from science and engineering backgrounds, such arguments from technical experts hold considerable weight. One indication of this is that China's pledges under the Cancun agreement are unilateral and unconditional, because many experts consider these as measures and goals China has to undertake for sustainable development, no matter what happens within the international climate negotiations. Right now, some scholars are proposing an absolute carbon cap on certain rich provinces, and a long-term cap for the whole country.

The same group of Chinese academics and environmentalists referred to earlier, who challenged the US in an open letter to Todd Stern, also delivered an open letter to Xie Zhenhua, China's special representative on climate change.¹⁷ After expressing appreciation for China's efforts to address climate change, the letter went further to question the appropriateness of following the US example with respect to the mode of production on the one hand and the prevailing consumption patterns and material lifestyle on the other. One of the main initiators of the letter, Professor Zheng Yisheng from the Chinese Academy of Social Sciences, said:

¹⁷ This letter can be downloaded at www.foe.co.uk/resource/letters/letter_chinese_negotiators.pdf



A man walks in a dried-out pond in Fanglang village, Yunnan, 25 February 2012.

We are critical of such emulation and believe it to be necessary for the whole country to reflect carefully on what basic philosophy about economic production and consumption we should adopt and adhere to... China should aspire to become the world pioneer in meeting the basic needs for all through environmentally sustainable means of production and consumption. This is indeed a tall order. But facing the draconian challenge of climate change, as exemplified by the recent devastating floods in Pakistan, we urgently need to work together with many like-minded people around the world to explore [a] new development paradigm for humanity.

But many experts, particularly those from political science or economics backgrounds, tend to rather look at things from the perspective of geopolitics and international power play. Many regard climate change as just another excuse for the West to hike up the price of its green technology or to constrain the growth of developing countries. Thus, no limits to growth should be accepted, as climate change is merely a Western plot rather than a real threat. Such sceptics have always existed, but they have become much more vocal and influential since Copenhagen. The international climate politics have played out exactly the way some Chinese sceptics had predicted, and consequently many ordinary citizens side with them. It is worrying that this kind of thinking is increasingly also seeping into academia, and potentially also the government. For example, some scholars have openly criticised the Chinese delegation, arguing that their Copenhagen tactic was totally wrong. China should have made its targets conditional, just as the EU did. They were too soft to start with, they claim, and not as cunning as the West.

In the summer of 2009, I met a senior government energy expert who eagerly discussed with me how the international negotiations could facilitate more domestic action. When I met him again in the summer of 2011, he had totally given up hope on that. Instead, he argued that we should not talk about 'low carbon' anymore, because the phrase had become absolutely poisonous. I largely agree with this assessment: 'low carbon' is still a buzzword in the media, but it sounds phony and pretentious to many people post-Copenhagen. It is probably better to use terms such as 'energy security' instead. His question for me now was: How could one build a firewall to prevent the Annex 1 countries' backtracking on commitments, shifting of goalposts and unfair China-bashing within international climate politics and negotiations from reaching the Chinese public and causing further damage? Compared with his outlook back in 2009, it was a considerable and sad change.

Yet, the West continues to be more or less ignorant of these important internal dynamics within China. On 10 January 2010, a Reuters report



The poor provinces need the atmospheric space to develop, and they are already more negatively impacted by climate change as they are more heavily dependent on agriculture and lack the infrastructure necessary for adaptation.

entitled ‘Snubbed in Copenhagen, EU weighs climate options’ told us: ‘Officials acknowledge privately that the mandatory system for enforcing emissions curbs created by the 1997 Kyoto protocol is doomed because China won’t accept any constraints on its future economic growth, and the United States won’t join any agreement that is not binding on Beijing’ (Reuters, 2010). This is a dangerously erroneous assessment, because it could become a self-fulfilling prophecy. By failing to recognise China’s ongoing and substantial actions to address climate change, and by ignoring any good will on the part of the Chinese delegation while instead demanding more one-sided compromises,¹⁸ the West is persistently undermining the potential allies they might have within the Chinese government and giving more evidence to support the sceptics. It is easy to blame China for not being the perfect hero the West itself does not strive to be, but how does this help the climate regime?

China as a microcosm of the world

In a sense, China is a microcosm of the world. The rapid economic growth of the last 30 years has resulted in an alarming polarisation between rich and poor. China’s ‘Gini index’, the commonly used measure of inequality, was below 30 in the 1980s – comparable to more egalitarian countries such as Norway and Sweden. It has climbed to around 45 today, more similar to the US or Latin American countries.¹⁹ The per capita GDP ratio of the richest and poorest provinces is more than 8:1, while the ratio between the US and China per capita GDP is 10.7:1.²⁰

Su Wei, China’s lead negotiator, admits that he also faces very tough negotiations at home, vis-à-vis the province heads in the distribution of the national target down to the province levels. This is a very similar dynamics to what we see at play on the international scene: the poor provinces need the atmospheric space to develop, and they are already more negatively impacted by climate change as they are more heavily dependent on agriculture and lack the infrastructure necessary for adaptation. The rich cities and provinces meanwhile want to continue their joy ride of rapid development driven by cheap fossil fuels. Many of these provinces would prefer a ‘pledge and review system’, instead of having the targets allocated to them based on science and equity principles.

¹⁸ For example, if the EU’s 30 per cent target could be put forward as unilateral and unconditional, it would be applauded. But when China put forward its targets as unilateral and unconditional, the response is more MRV (Measurement, Reporting and Verification) and ICA (International Consultation and Analysis).

¹⁹ Data from World Bank database: <http://data.worldbank.org/indicator/SI.POV.GINI/countries?display=default>

²⁰ According to the IMF’s ‘World Economic Outlook’ (2012), China’s per capita GDP was US\$4,382 in 2010, compared to US\$46,860 for the US.

For the 12th five-year plan (FYP), 2011–2015, the allocation of national targets to province levels took months of negotiation. In August 2011, the State Council issued the 12th FYP Energy Saving and Emission Reduction Comprehensive Work Program, breaking down the national targets into provincial and local levels. In contrast to the 11th FYP, in which provincial targets were almost uniform across the board, the provincial targets have been differentiated with respect to their different development stages: the richest province (Guangdong) has the highest carbon-intensity reduction target of 19.5 per cent and the least-developed provinces, including Hainan, Xinjiang, Xizang and Qinghai, have set 11 per cent or 10 per cent as targets. Overall, the 12th FYP also sets the target of GDP growth rate at 7 per cent (actual GDP growth rate during the time-span of the 11th FYP was above 9 per cent), signalling that the central government is giving more weight to quality over quantity of economic development. However, so far, all the provinces have announced their planned and projected GDP growth rate during the time-span of the 12th FYP to be above, or even well above, 7 per cent. Meaning, even though carbon intensity targets have been allocated to the provinces, once we put the projected GDP growth rate and carbon intensity reduction target together, the pledges by the provinces do not add up to the national five-year target of annual 7 per cent growth with 17 per cent carbon intensity reduction. Internal discussions, debates and negotiations are still ongoing. The way the current international climate architecture develops – whether a top-down aggregate system is preserved and strengthened, or whether it will be further weakened and even replaced by a much weaker pledge and review system – will, needless to say, influence China's internal discussion and approach as well.

Those who have visited Chinese cities such as Beijing, Shanghai or Tianjin may have the impression that China is rather developed, and that it should thus join the ranks of the advanced developed countries. This has become a central question, especially after the US president, Barack Obama, reportedly told the Chinese president, Hu Jintao, in November 2011 that China had to act more responsibly, now that it has 'grown up'.²¹ Firstly, as shown in previous sections of this article, China already acts more responsibly than the US on the climate front. Secondly, China's booming cities are only one part of China. In the other part, the vast rural areas that foreigners rarely see, and where approximately half of the population still lives, the situation is rather different. For example, in September 2010, I visited an organic farmer friend in Hebei province. His village now has running water, but it only comes once every five days. This is not a village in some remote corner of the country; it is only a one-hour bus ride from Beijing.

21 See BBC report on this at <http://www.bbc.co.uk/news/world-asia-china-15718392>

This is why the equity discussion, both international and domestic, is so important to China. The ‘common but differentiated’ responsibility that China is insisting on internationally, so as to claim ‘development space’, is much more than mere political rhetoric. It is also crucially important domestically for decisions on how the rich and the poor in the country should share the burden of mitigation and adaptation. In a private conversation, an energy expert once expressed his grave concern to me: ‘No matter how much ecological space we still have, if we don’t change the current growth model, the rich cities will use up most of it, leaving little space for the rural areas to develop.’ This is a sad mirror image of the world: rich countries may continue to use up the precious remaining atmosphere space, leaving little space for poor countries. This is why it is important to quantify common but differentiated responsibility based on science and equity principles. Grandfathering emission rights will allow not only the developed countries to continue their high carbon production and consumption patterns, but also the rich within China and other developing countries to follow suit. Needless to say, in that case our climate future is doomed.

In order to avoid this scenario, we have to assess candidly how much carbon space still remains, and how we can share it, based on science and equity. Another important fact to be clear about is that a carbon budget approach does not give China a ‘get out of jail free’ card. According to calculations by various Chinese experts, with convergence of accumulative per capita emission (a common assumption often used by various carbon budget approaches), China is likely to use up its carbon budget some time between 2040 and 2050. Chinese experts who are working on these topics know this fact perfectly well, and some of them are quite keen to push this message, thus encouraging more public discussion on sustainable development. But with the developed countries currently not taking on fair commitments, and not even discussing equity issues within the UNFCCC negotiations, it is much more difficult to advance such discussions in China.

Outsourcing emissions is not a solution

One major reason for China’s fast growth in carbon emissions is that it has become the ‘world’s factory’, or more precisely, the ‘factory owned by the world’. Many companies, including some of the most environmentally harmful, are subcontractors or direct sub-units of multinational corporations from the US, Europe and Japan. They are churning out more and more cheap consumer goods for Western consumers. In essence, China is the kitchen, while the West is the dining-room.

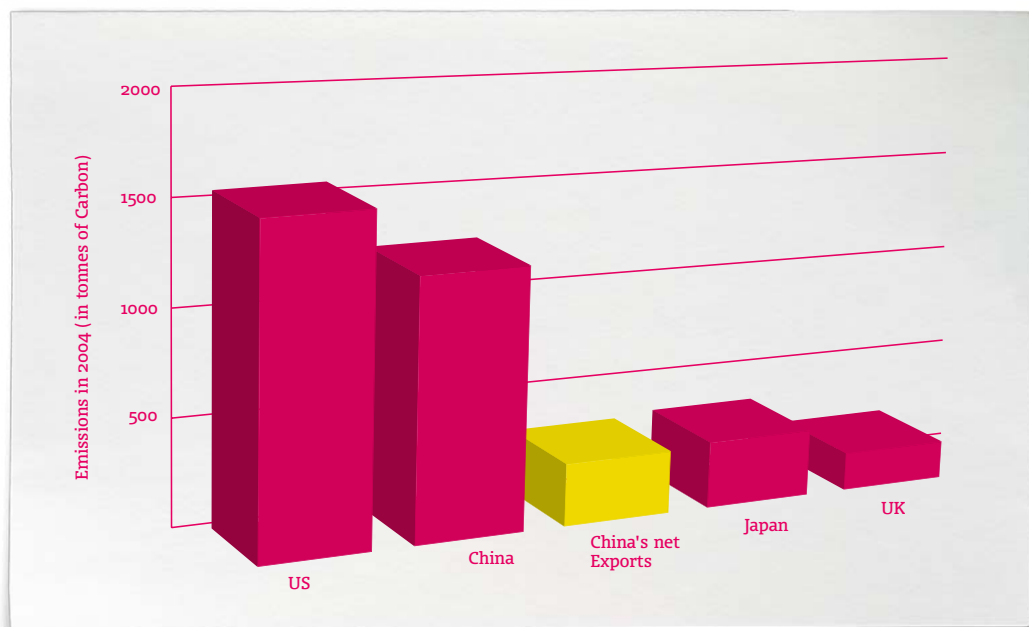


Figure 3: China's emissions due to exports compared to other major emitters (Wang et al., 2007)

According to calculations by Tao Wang of the Tyndall Centre for Climate Change Research at the University of Sussex, China's emissions from exports in 2004 amounted to 1,490 million tonnes of CO₂, while CO₂ emissions avoided amounted to 381 million tonnes. Thus, 23 per cent of China's emissions were due to net exports (Wang et al., 2007). This number is lower than some estimates by government officials and other researchers, who claim that one-third of China's emissions derive from exports (Bina et al., 2008).

Figure 4 (p. 142) shows how China's carbon emissions have soared since 2000, along with its exports. This not only makes manifest the thorny issue of 'who owns China's emissions', but also shows the failure of the 'not in my backyard' type of elite environmentalism. Indeed, developed countries have successfully exported their manufacturing activities to developing countries together with the carbon emissions and other related pollution.

A 2012 report by an influential committee of British MPs found that the UK's greenhouse gas emissions related to consumption have increased since 1990. The report noted:

The UK's territorial emissions have been going down, while the UK's consumption-based emissions, overall, have been going up. The rate at which the UK's consumption-based emissions have increased have far offset any emissions savings from the decrease in territorial emissions. This means that the UK is contributing to a net increase in global warming. (Harvey, 2012).

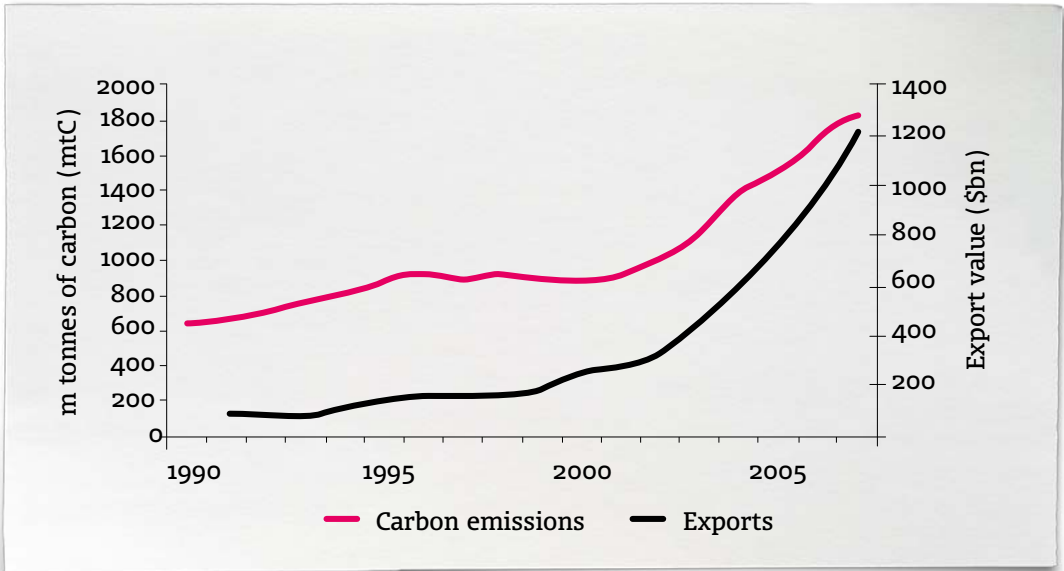


Figure 4: Carbon emissions and exports grow hand in hand (Wang et al., 2007)

As China is a microcosm of the world, the temptation for the more developed regions within the country to adopt a similar strategy is worrying. Now that the richer cities and regions are setting tougher emission reduction targets compared to the less developed regions, the easy way out is to relocate emission-intensive industries to poorer regions in order to achieve the local targets. Needless to say, this will help little, or even prove counter-productive to achieving the overall national target. All of us share one planet, and there is no way to outsource the greenhouse gases from it. Therefore, to address this problem, what is needed is a consumption-based accounting of emissions.

Hope for China or not?

Hans-Josef Fell, a Member of Parliament and spokesman on energy for the German Greens' parliamentary group, when asked on 26 November 2010 about his expectations of the Cancun meeting, answered that he did not have much hope for it. Then he added, 'Yet I have great hope for China. China has the world's biggest reforestation project, and the fastest growing renewable energy sector. We can all learn something from China.' In view of the China-blaming so common in the Western narrative, it is refreshing to learn that someone acknowledges China's efforts. However, compared to him, I have more mixed feelings about China's climate politics.

China's leadership does take science very seriously. This is partly why China is going full gear on energy efficiency and renewables, which many developed countries have yet to do. In this sense, there is indeed hope for China.



No matter what the technical experts' opinions are, the view held by the majority of the general public in China is: 'China should do what the West does, not what the West says.'

But these technological advancements will not be sufficient in themselves. On 22 February 2012, the National Statistic Bureau released the annual economic and social development report for 2011. The energy-intensity reduction in 2011 was only 2.01 per cent compared to the target of 3.5 per cent. Multiple factors contributed to this result. The 4 trillion Yuan economic stimulus plan continues to fuel a building boom, which is energy-intensive. This stimulus package, in response to the global economic recession, was generally seen as 'green' by commentators, but apparently it is not green enough. It also signals that the low-hanging fruits have been harvested in the previous several years, while the remaining problems are tougher to tackle. For example, with more and more electricity coming from super-critical and super-super-critical power plants, there remain few small inefficient power plants to close down in order to achieve efficiency gain easily. Consumption and lifestyle changes have to be on the agenda as well. More Chinese need to realise that an emulation of the US lifestyle is nothing but a dead end. There are discussions along these lines in China, but so far the scope is far too limited to have any significant impact.

Many of us who have wanted to push internal discussions in this direction feel that hope has been further dampened by international climate politics within the last few years. No matter what the technical experts' opinions are, the view held by the majority of the general public in China is: 'China should do what the West does, not what the West says.' With the West persistently trying to shift the burden to developing countries, it will be nothing but disastrous if China emulates the 'leadership' displayed by the West.

It has been particularly sad to see the EU giving up the real climate leadership it exhibited to rescue the Kyoto Protocol and the climate regime in general during the Bush era. It has squandered and ignored the real possibility of working with China (and the G77 in general), to build an alliance of trust and ambition which would put real pressure on and bypass the US and insist on a thorough, principled climate regime with aggregate binding mitigation targets under the Kyoto Protocol and the Bali Action Plan. The EU could have seen Copenhagen and the following years under a second commitment period as a period of trust-building and could have scaled up ambitions, strengthening a regime of binding reduction commitments that China would also become part of in the not-so-distant future. Instead, the EU walked the US's way, pushing China in the wrong direction as a result of blame games and by shifting goalposts, (for example, obtaining a mandate for the Durban Platform while not delivering on the Bali Road Map). It echoes Washington's fear of becoming a fading superpower and it provokes China. It also allows the world – and the climate sceptics and growth-oriented factions in China – to abandon the current regime for an unambitious pledge-and-review world that is pointing straight to disaster.

The EU's actions are actually pushing China towards becoming another US down the road. Some people say that there is no use in putting pressure on the US. Given the status of the United States as the world largest hegemonic power and its sorry state of internal politics, there is some truth in this – it is indeed very hard to push the US to take more domestic actions on climate. But internationally, the pressure and the stand still matter greatly. For example, after Copenhagen, Canada lowered its announced 2020 targets, stating specifically that this would be in line with its neighbour, the United States. This could not have happened during the Bush era. Back then the US was too isolated for any other developed country to follow suit. Now, following the US, developed countries, one after another, are exiting the binding climate regime. The entire climate regime has become the captive of internal American politics, and the EU's complacency has played no small part in this. Increasingly, I have been asked the following questions by my Chinese contacts: 'Is the EU sincere about the climate? Or are they simply hiding behind the US?' How the world engages with China will shape how China will behave down the road. The crucial question is whether China will become another irresponsible superpower like the US. In view of the serious threat of the international climate regime being dismantled, this is a danger we should not underestimate. Or will it join the Annex 1 countries and assume greater responsibility for preserving and strengthening the existing climate regime?

Is there, in the West, a leadership that will question the current development paradigm and begin to build alliances with China for another development path and a sustainable climate future?



Thus, returning to the question raised at the beginning: How serious is the West about climate change? Is there, in the West, a leadership that will question the current development paradigm and begin to build alliances with China for another development path and a sustainable climate future?

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Climate change, equity and development – India's dilemmas

Praful Bidwai

Climate change confronts the world with epochal environmental and development challenges. The causes of climate change lie primarily in the historical greenhouse gas (GHG) emissions of the developed countries of the North, called Annex 1 countries in the UN climate convention. These account for three-fourths of all GHGs accumulated in the atmosphere. But the effects of climate change are concentrated in the South, where four-fifths of the world's peoples live.

It is thus evident that at its core, climate change is about equity and justice. This is certainly true in terms of North-South relations, but also in terms of inequalities within countries – both in the North and in the South. This article seeks to discuss both these challenges – globally, and with a particular focus on India. India has traditionally taken a strong stand for equity in international negotiations, insisting that rich Northern countries accept and deliver on their historical responsibility, and that poor countries of the global South must have the right to 'development' and access to the rapidly shrinking 'atmospheric space' that remains.

This stand is undeniably justified and reflects the right of developing countries to find ways to meet the basic needs of their people. Yet, this very notion of equity is deeply contested and constitutes a fault line in the international negotiations. The rich Annex 1 countries have failed to live up to even a fraction of their commitments and responsibilities. This immoral and unacceptable state of affairs must be exposed and rectified.

However, while deploring the role of the historically biggest polluters, it is also important to scrutinise the rhetoric deployed by governments of the South. Does their insistence on equity also hold within their own boundaries? Are their action plans and domestic policies in line with the harsh reality of climate science and the need for *all* countries to more or less soon reduce and eventually eliminate GHG emissions?

What are the nuances and internal political battles within a country such as India, and what are the global implications? Without for a moment

minimising the legitimacy of the demands placed on Annex 1 countries by developing countries, and the latter's claims to a fair share of the remaining carbon budget (and compensation for historical emissions), Indian scholar-activists, citizens and others must also question the country's own elites, scrutinise the often conflicting motives of those in power, and, most importantly, insist on and mobilise forces for a radical transformation of development models away from consumerist, Western-inspired ideals to truly sustainable, resource-lean alternatives with a much higher quality of life. Domestic actions and policies must be consistent with demands and behaviour at the international level.

International inequity

Let us first look at the international, North-South dimension. The South is far more vulnerable to climate change because of geographical, atmospheric and hydrological factors; its poverty, undeveloped infrastructure, lack of early warning systems and emergency preparedness; its low capacity for adaptation; and the poor availability of resources for relief and rehabilitation. These factors are compounded by the indifference or apathy of bureaucracies towards underprivileged people, and not least, relatively low public awareness of climate issues.

The climate crisis is a double whammy for the South. And it is especially harsh on its poor.



Joel Bassuk / Oxfam

The climate crisis is a double whammy for the South. And it is especially harsh on its poor. This was recently underlined by UNCTAD's *Least Developed Countries Report 2010*. The Least Developed Countries (LDCs) account for less than 1 per cent of the world's total GHG emissions, but the frequency and intensity of extreme weather events in them are five times higher now (519 events in 2000–2010) than during the 1970s (UNCTAD, 2010:116). In the last decade, about 40 per cent of all casualties related to natural disasters were found in LDCs, the poorest countries of the world (UNCTAD, 2010:116).

This is doubly unjust. The crisis cannot be resolved unless the world upholds the twin principles of environmental effectiveness and development with equity. A change of direction, and strong moral and political leadership that produces an emergency action programme, are needed to avert a catastrophe. This programme must include deep and early emissions cuts by the North, a serious commitment by the emerging economies to reduce the growth of their emissions and major initiatives for adaptation and low-carbon technology development worldwide.

The North owes a climate debt to the South. And it will continue to rise unless the North reduces its GHG emissions drastically – by at least 40–50 per cent by 2020 (over 1990), and eliminate them altogether in the following two decades. The North's past emissions, coupled with its failure to reduce current emissions substantially, have left only a minuscule carbon budget on which Southern countries must draw to pursue their development goals of providing their poor people a modicum of food and water security, healthcare, literacy, elementary education, access to energy and employment security.

The longer the North delays making deep emissions cuts, the smaller the development space left for the South. In effect, the North is squatting in global climate space, and depriving the South of access to it. The North must vacate the space.

By 2009, the world had already exhausted one-third of its CO₂ budget (1,000 billion tonnes, or gigatonnes) for the first half of this century, a budget compatible with a 2°C rise in average global temperatures. The world has spent 44 per cent of the stricter budget (750 Gt) demanded by CO₂ stabilisation at 350 ppm corresponding to a likely 1.5°C global warming level (Athanasίου et al., 2009). There are no signs that the globe's principal emitters will act urgently to cut their GHG emissions aggressively so as to remain within this budget. They have failed so far even to pledge the requisite emissions reductions.

After the Durban UNFCCC conference in November–December 2011, which failed to agree to urgent emissions cuts and postponed all serious climate mitigation actions beyond 2020, global warming is set to rise 3–5°C (over preindustrial temperatures) instead of the 1.5–2°C threshold the Earth can tolerate. Durban's key outcome, 'The Durban Platform for Enhanced Action', represents a big setback and continues the retrogression begun at Copenhagen.

Under the pledged reductions, CO₂ concentrations will probably spurt to 700 ppm, if not 800 ppm, and global warming will rise to 3–4°C, even

5–6°C.¹ This will produce absolute climate havoc, cause colossal physical and economic damage, threaten millions or even billions of livelihoods and displace people on a scale never before witnessed. Some eminent scientists warn that only a small fraction of the world's population, perhaps 10 per cent, will survive at 4°C global warming (*Scotsman*, 28 November 2009).

The Global South, beginning with the small island states and coastal LDCs, including large parts of India, will be the first victims of catastrophic climate change, which now seems next to inevitable.

The South faces a great dilemma. In the absence of affordable and adequate low-carbon alternatives, much of the South can only pursue its development goals by relying on fossil fuels, which will raise emissions in the short run. As Baer et al. (2008) put it: 'From the South's perspective, this pits development squarely against climate protection... 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 stabilisation.'

Climate change thus translates not just into an environmental crisis, but also into a development crisis that threatens the poor. This greatly narrows the South's options, although it does not eliminate them. In both the 1.5°C and 2°C pathways to stabilising global warming, the South is left with remarkably little carbon space even if the North undertakes much deeper emissions cuts than currently pledged. The South's emissions must peak only a few years after the North's, and thereafter decline continuously till 2050 (Baer et al., 2008).

Yet, the South cannot simply be asked to undertake emissions cuts, certainly not legally binding ones, until it has addressed a good part of its development deficit. Equally, the North must accept the obligation to provide financial and technological support to enable the South to mitigate and adapt to climate change. This raises major issues of North-South and rich-poor equity, environmental responsibility, mitigation obligations and burden-sharing.

The climate negotiations impasse shows that the world is currently unable to muster a worthy response to a crisis that threatens millions of lives in the short run, and ultimately the survival of humanity itself. The world's political, corporate and military elites seem to be losing the will to combat climate change. They are increasingly inclined only to manage its consequences – by policing or suppressing protests arising from economic and environmental crises, acquiring emergency powers,

¹ See <http://climateactiontracker.org/news/128/Governments-set-world-on-more-than-3C-warming-still-playing-with-numbers.html>



In India, disparities in per capita emissions between the top and bottom districts or prefectures are of the same order or even higher than global North-South differences in per capita emissions.

suspending civil and political rights, using force to quell conflicts and building up formidable security apparatuses. Efforts are under way to convert the climate crisis into a security threat.²

The climate crisis is deepening just as the world faces numerous other crises, which feed on one another. The world is still in the grip of the worst global economic recession and sovereign debt crises in decades. There is a worsening social crisis, with increasing poverty in both South and North, expanding income inequalities, undermining of social cohesion and the ugly spread of Social Darwinism. The global environmental crisis is worsening by the year with the loss of biodiversity, disappearance of species and the unrelenting pollution of land, water and air.

The global political crisis is manifested in a severe erosion of people's participation especially in the 'mature' democracies, marginalisation of citizens and the snatching of decision-making powers from the public and parliaments and their concentration in the hands of capital and unaccountable international institutions.

This occasions critical reflection on many issues: anomalies in the dominant market-based economic model pursued by a majority of countries; transition to low-carbon lifestyles based on a qualitatively different relationship between production, consumption and natural resources; and the urgency of ensuring that underprivileged people – the worst victims of climate change – do not suffer further pain because of the world's failure to negotiate an effective climate agreement. Ultimately, resolving the climate crisis will necessitate a structural transformation of existing relations of power in many spheres and a sea-change in the manner in which society is governed.

India: The domestic context

These challenges are strikingly evident also when considering intra-South inequities and inequalities within nations and regions in sharing the burden of emissions mitigation. These are enormous. For instance, in India, disparities in per capita emissions between the top and bottom districts or prefectures are of the same order or even higher than global North-South differences in per capita emissions.

The climate crisis thus confronts India with many questions. India is emerging as a major power, despite the persistence of mass deprivation and poverty. Yet, there is little genuine domestic debate on how and to what ends India should deploy its growing power. How can it be used

² Two such attempts were indeed made in the UN Security Council in 2007 and in July 2011. Many Southern states opposed them.

to make the world less unequal, unjust, conflict-prone and violent? The Indian elite relishes power and recognition, but it does not pause to ask what purposes India's power should serve.

The climate crisis should bring home to Indian policy-makers the reality of many domestic, regional and global asymmetries in the distribution of power and privilege. Not only is addressing such challenges a moral imperative, it would also provide vastly more traction and a more solid basis for tough and principled negotiations internationally.

India has a vital stake in combating climate change because it is highly vulnerable to it. India's growth process has resulted in extensive environmental damage and degradation, which heightens its vulnerability. With a 7,500 kilometre coastline, many large floodplains of monsoon-fed rivers and high livelihood dependence on agriculture, India stands to lose heavily from cyclones and coastal storms, erratic rainfall patterns and more frequent floods and droughts, leading to low crop yields, more hunger and forced migration.

The global climate negotiations confront India with a huge challenge: reconciling the objectives of 'development' and poverty reduction with the global responsibility – and an obligation to its own citizens – to contribute to the fight against climate change. This entails combining developmental equity with environmental effectiveness, a task never before attempted anywhere on such a scale.

Hiding behind the poor through per capita norms

So how is India doing, as seen within a domestic context? In many ways, India has tried to rise to the challenge, somewhat reluctantly, and in a manner that is often awkward, inadequate, ambivalent, and in part even negative and obstructionist. India asserts that all human beings must have equal access to global environmental resources (or 'climate space'). Hence, India will ensure that its per capita emissions will never exceed those of the North. That is the only long-term climate-related commitment that India accepts. India refuses quantitative emissions reduction obligations not only now, but also for the foreseeable future, although it has offered to reduce by 2020 the emissions intensity of its GDP by 20–25 per cent (over 2005 levels).

Climate equity, the current Indian mantra internationally, has many dimensions, however. These include equity *within* nations and between them; equity in respect of current and future emissions vis-à-vis historical emissions; North-South environmental equity – subject to a right to the minimum necessities of life for underprivileged people; convergence between nations in the carbon intensity of GDP; equity in

burden-sharing for remedial action; equity in respect of the technological and financial capabilities of different societies and classes to meet their climate-related obligations; and so on.



The climate debate should provoke serious engagement with the Gandhian legacy of austerity premised upon a radical critique of industrialism and consumerism.

Indian policy-makers remain fixated on only one, limited, notion of equity anchored in national per capita emissions. But this means little in a society as deeply divided and unequal as India's, where the average individual emissions of the rich exceed those of the poor by perhaps five to 10 times. Consumption by the affluent is the main driver of India's rising emissions curve.

The per capita norm is a shield that enables India's elite to *hide behind the poor* while indulging in profligate consumption and evading responsibility towards the underprivileged in its own society – an overwhelmingly important imperative – to which it pays only rhetorical obeisance.

The climate debate should provoke serious engagement with the Gandhian legacy of austerity premised upon a radical critique of industrialism and consumerism. Although Indian policy-makers pay lip service to it, they despise the Gandhian legacy. But the legacy survives among a majority of Indians in the simplicity and frugality that is part of their life. Elements of the legacy are built into what has been called 'the moral economy of the poor' (Thompson, 1993). It is necessary to integrate it into a needs-based development model, at the core of which lie social and economic justice, climate equity and environmental sustainability. Such a model must recognise that the pursuit of artificial wants spurs unbridled consumption. It must reject the market as the principal allocator of resources.

National Action Plan for Climate Change (NAPCC)

The reality of Indian policy-making is at the other end of the spectrum of the legacy of Gandhi's vision and the broad, participatory, democratic approach that is needed. Let us zoom in on an illustrative example, the formulation of the NAPCC.

The making of India's climate policy and global negotiations strategy takes place within a small cloistered group of politicians and bureaucrats, without broad consultation with independent experts, people's movements, civil society organisations or concerned citizens, leave alone those liable to be affected the most by climate change.

India's apex advisory body on climate matters, the Prime Minister's Council on Climate Change, has a remarkably lopsided composition. The 26-member council is heavily dominated by ministers and serving or retired bureaucrats. There are only two women and only one proper NGO representative on it. Worse, all except one of its members

are based in India's capital and its suburbs, the sole exception being industrialist Ratan Tata, from Mumbai.

India hastily announced in mid-2008 that it had drawn up the NAPCC. The plan fetishises GDPism or obsession with rapid growth, and fights shy of setting realisable targets and timelines. Its very starting point identifies not development but 'rapid economic growth' as India's paramount priority, and defines the real 'challenge' as maintaining such growth while meeting climate obligations (Government of India, 2008).

The operational content of the plan lies in the eight different national missions that were simultaneously announced by the Indian government. These are the National Solar Mission, National Mission for Enhanced Energy Efficiency, National Mission for Sustainable Agriculture, National Water Mission, National Mission on Sustainable Habitat, National Mission for Sustaining the Himalayan Ecosystem, National Mission for a Green India and National Mission for Strategic Knowledge for Climate Change. Each mission, according to the NAPCC, will be tasked with evolving specific objectives until financial year 2016-17. The plan originally mandated the nodal ministries/agencies to submit eight comprehensive mission documents by the end of 2008, to be approved by the Prime Minister's Council on Climate Change.

The deadline was missed by years at least partly because of bureaucratic lethargy. The drafting process was almost entirely left to ministry officials and the Prime Minister's Office (PMO), advised by a few individuals. In formulating the detailed mission documents, no consultations worth the name were demanded, and none took place, with independent experts, non-governmental organisations, civil society groups or the general public except in the Green India mission case.

Worse, the treatment accorded the mission documents and the missions themselves testifies to a cavalier attitude towards the NAPCC. Many of the mission documents have still not been finalised. Nor do they contain, as they should, strategies, operational plans, timelines and budgets. They are in varying stages of revision and reformulation. Some missions have been 'approved in principle'. Yet others have borne the description 'Final Draft' since April 2009 and even December 2008. Some missions have been orphaned by the nodal ministries. The PMO has not knocked the documents into shape, harmonised their format or integrated them into a revised NAPCC .

All but two of the NAPCC's eight national missions are of marginal or symbolic value. The Jawaharlal Nehru National Solar Mission, being



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The National Action Plan for Climate Change greatly disappointed those who expected it to convey an acute sense of the gravity of the climate crisis and of the urgency of corrective action; to set some domestic targets, even if voluntary and moderate ones, for reducing emissions in relation to business-as-usual scenarios; and to clearly enunciate India's priorities.

launched under the brand 'Solar India', is the most ambitious mission of all. Its latest, thoroughly revised, *avatar* has the merit of laying down some time-bound targets. The National Mission for Enhanced Energy Efficiency document too outlines some goals, strategies and action plans, with budgets and timelines, although it has fuzzier targets.

The missions on sustainable agriculture and water are based largely on recycling existing programmes, with some add-ons and without major changes of approach. The National Mission for a Green India emphasises reforestation of over 5 million hectares. The other documents only partially cover their mandate, are vague about objectives and strategies, have no coherent action plans, and largely rehash and restate existing plans and programmes.

The NAPCC greatly disappointed those who expected it to convey an acute sense of the gravity of the climate crisis and of the urgency of corrective action; to set some domestic targets, even if voluntary and moderate ones, for reducing emissions in relation to business-as-usual scenarios; and to clearly enunciate India's priorities.

Such enunciation could only have been based on a candid analysis of why India's present growth strategy is part of the problem, not the solution; why India's emissions are rising about twice as rapidly as the global average; and in what measure its people, in particular the poor, have become vulnerable to climate change. Equally, the analysis would have focused on averting and discouraging emissions-intensive growth, reducing inefficiency, adopting a sustainable urbanisation model and changing elite lifestyles. Alas, the plan falls way short of this.

There is a huge void in the NAPCC. It makes no commitment to equity or redistribution, which is of pivotal importance given the huge disparities of wealth, income and consumption in India's super-hierarchical society. The plan only speaks of 'the principle of equity' at the global level, and that too in per capita emissions. It pledges 'a qualitative change of direction', enhanced 'ecological sustainability' and 'inclusive and sustainable development'. But this is not reflected in the approaches and measures actually outlined in the plan.

Thus, the plan does not aim at radical change in the prevalent pattern of consumption, which has led to a sharp rise in India's overall emissions, much of it attributable to the luxury consumption of the affluent. Rather, its emphasis by and large is on maintaining existing growth and consumption patterns, including elite lifestyles, while improving the efficiency of energy use, promoting renewable energy to some extent

and adopting some new market-based instruments or administrative means to achieve limited goals in a few other areas. That does not add up to a change of direction.

The plan is totally silent on adaptation to climate change except for listing a slew of already existing social sector schemes, which do not properly belong to that agenda and were launched independently of it. Adaptation is critical for India, but the plan does not attempt to discuss the content and substance of adaptation, leave alone outline an overall strategy or ecosystem-based and sectoral programmes for reducing vulnerability and increasing people's resilience.

Above all, the NAPCC *lacks a long-term vision*, a coherent strategy and an overarching policy thrust. It sets no short-, medium- or long-term goals, and for the most part, no physical targets. It offers no baseline data on current GHG emissions from different sources or sectors – it uses outdated official estimates going back to 1994 – and their likely trajectory. Nor does it commit itself to pathways to low-carbon development, to be routed through quantifiable targets and goals. Similarly, it sets no targets for reducing the energy or carbon intensity of the economy and of major industry groups.

Understanding Indian climate politics

How does one understand Indian climate politics? What is its context, as defined by the realities of existing power equations? What explains the insufficiencies and flaws in the NAPCC and its failure to take the bold steps that are necessary?

Currently, three different strands or strategic lines of thought dominate Indian climate policy discourse. There is a great deal of interaction and sometimes an overlap between their proponents. They are in a state of mutual competition and yet amenable to reconciliation, even if awkward.

The first strand might be called the '*Cynicism of the Indifferent Outsider*'. It holds that the climate crisis is 'their' (the North's) problem: we have nothing, or very little, to do with it. 'They' created it, they aggravated it, now they must resolve it. India at best has only a peripheral role in the business of stabilising global warming. We account for just 4-5 per cent of global emissions and we can go even higher without causing real harm to the world. After all, did the world protest when China grew at a furious pace and increased its emissions massively in the 1980s and the 1990s? Why can India not get a 20-year-long breathing space?

The first strand in Indian climate policy might be called the 'Cynicism of the Indifferent Outsider'... We must concentrate on rapid GDP growth and quickly reach a point where the world has no choice but to listen to India – when India's economy reaches a certain size and its political clout becomes massive. Meanwhile, let the Kyotos, Copenhagens and Durbans go on.



Above: Gulu Lalvani, Chairman, Royal Phuket Marina, Thailand, at the 2010 Horasis Global India Business Meeting - Does India have the right infrastructure to drive double-digit growth?

If the world does not respect India's right to grow and prosper – without exploiting other nations and peoples, as the Western colonial powers did – then we should be happy if the climate negotiations collapse or fail to produce an ambitious, effective and enforceable deal. Maybe we should even work for that outcome. That will at least give us some breathing space. We must concentrate on rapid GDP growth and quickly reach a point where the world has no choice but to listen to India – when India's economy reaches a certain size and its political clout becomes massive. Meanwhile, let the Kyotos, Copenhagens and Durbans go on.

The second strand may be described as '*Engagement with Entitlement*'. It believes in real engagement with the UNFCCC process and also in taking domestic actions independently. Its theme runs thus. Climate change is a serious issue. It is also *our* issue. We must embrace low-carbon development. If we do not join the fight against climate change, it is our people who will suffer.

A good climate agreement that is tough on the North and lenient towards the South should be India's *first* choice. But a full-fledged, new and legally binding post-Kyoto treaty that imposes tough obligations on any Southern countries will not be in India's *second* choice, if the North does not face up to its responsibility to take the lead with drastic emissions cuts, will then be a weak deal like Copenhagen or Cancun, with voluntary pledges by all. This would be vastly preferable to a high-ambition deal that imposes stringent obligations with little or no differentiation between Northern and Southern countries in the future.

The third strand is best termed '*Bargaining-Oriented Pragmatism*'. It emphasises bargaining in contrast to principles, rights or entitlements. It does not put a premium on India's entitlement to greater climate space. Nor is it particularly keen on a specific outcome from the talks, other than that it should not impose a cap on the emerging economies' emissions. Rather, it focuses on getting the best out of a climate deal whenever it happens: large financial transfers; room for further expansion of fossil-fuel use in the South; and continuation of the Kyoto Clean Development Mechanism. This approach is compatible with both a bad outcome or failure of the climate talks, as well as a more positive agreement.

This third approach is deeply irresponsible in that it promotes a passive and tailist attitude. Some of its proponents do not limit deal-making to climate-related bargains, but look for climate-unrelated 'grand bargains' such as a permanent seat for India on the Security Council, a decisive pro-India shift in the US-India-Pakistan relationship or a special 'side deal' in world trade negotiations. At a minimum, they want to leverage India's position as a booming market to drive a better climate-plus bargain.

The contestation between these different strands is unresolved. Regardless of which of the three strands eventually prevails, the overall prospect is not exhilarating. A *fourth strand* is what's needed, one which would be based on equity (also in the domestic context) and high ambition in terms of transforming society and putting it on a truly low-carbon trajectory. This strand would question and reject the present over-riding growth-centred neoliberal mindset. For such a new, positive, strand to emerge anytime soon, one which is deeply committed both to a worthy global climate deal and to low-carbon growth in India, public opinion must radically change, grassroots movements actively engage with the climate agenda and political parties get into the climate debate with a progressive approach.

Taking leadership

Climate change demands a radical agenda of redistribution – both in the South and in the North – and requires true leadership from a country such as India.

The ethical foundations of India's professed climate policy are based on narrow and internally inconsistent notions of equity in its environmental as well as developmental dimensions. For all the elevated rhetoric about justice and equal rights, India's positions essentially articulate the interests of its small but exceedingly powerful consumerist elite, roughly 10 to 15 per cent of the population, which has a high stake in raising its emissions and believes it has the 'right' to 'get even with' the North, no matter what happens to the climate. India's privileged minority cynically chants the mantra of North-South justice in pursuit of this 'right'. But it can obviously suddenly swerve to supporting a thoroughly unprincipled and ineffectual deal, as happened at Copenhagen and Cancun.

India must indeed stand firm in its insistence on international climate justice and securing atmospheric space for its population in both UNFCCC and other forums, but it must also face the full implications of the climate challenge at home. Climate change demands a radical agenda of redistribution – both in the South and in the North – and requires true leadership from a country such as India and its allies within, for example, the BASIC grouping.³

If India and the other BASIC countries want to remain relevant, they will have to do much more than blandly reaffirm the principle of common but differentiated responsibilities (CBDR). Gradations and nuances must be added to CBDR in keeping with contemporary realities, and in line with the fourth, truly equity-oriented strand outlined above. Such a modified approach must shape policy-making that is coherent in both its international and domestic dimensions.

3 India had a major part in bringing together the BASIC grouping, comprising Brazil, South Africa, India and China, just before Copenhagen in December 2009. This was a landmark development representing new self-assertion on the part of emerging economies in the UNFCCC negotiations. BASIC, whose GHGs are growing faster than the world's, was formed soon after China surpassed the US as the world's biggest emitter in absolute terms, and the perception grew that the new bloc would play a key role in the talks.



Developing countries, although much poorer than even the less affluent Northern nations, together now account for 55 per cent of global emissions. BASIC is under growing pressure to accept binding obligations, albeit less stringent than the North's. While insisting on fairness and differentiation according to clear equity principles, such as, for example the Greenhouse Development Rights framework (Baer et al., 2008), India and BASIC should take moral leadership and offer pledges that would further shame and make it more difficult for the North to duck its obligations. BASIC must support the G77's effort to defend the gains of past UNFCCC negotiations, preserve the Kyoto Protocol's rational kernel of science-based aggregate, top-down emissions reductions and promote cooperative action based on international solidarity.

India and BASIC should categorically declare that they want a strong, fair, ambitious and binding climate deal and that they are prepared, in the world's long-term interests, to sacrifice perceived short-term gains for their elites from any low-ambition deal – no more Copenhagen Accords in the future. Second, they must show they accept their share of climate responsibility regardless of the North, by launching significant voluntary domestic efforts at mitigation, adaptation and clean technology development even without external support. These must have a strong equity component.

Thirdly, India and BASIC should offer generous, unconditional financial and technological support for adaptation and mitigation in the LDCs and small developing countries with low capacity. Altogether, this would further expose the North's failure to take responsibility, shift the moral leadership and help break the current deadlock – something that might eventually contribute to a just and ambitious climate deal.

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Copenhagen, 17 December 2009



CLIMATE

CLIMATE
SHAME





Part III » What Next?
– On Real and False Solutions

Climate as investment – Dead and living solutions

Larry Lohmann

Shadowed by simultaneous crises – financial and climatic – the world is humming with determined talk about investments that might both mitigate global warming and put business back on its feet (Ban Ki Moon and Gore, 2009; Goldenberg, 2009; Jura, 2008; Stern, 2009). The United Nations, together with various development, business and non-governmental organisations, is urging a ‘Green New Deal’ (Jackson, 2009; UNEP, 2009); Barack Obama has set out a us\$787 billion tax and investment package ‘to create and save three to four million jobs, jumpstart our economy, and begin the process of transforming it for the 21st century’ (US House of Representatives, 2009); and coal-powered utilities and oil companies are begging for billions in public money for technologies to capture carbon dioxide from their smokestacks and bury it underground. Progressive activists are demanding that corporate tax evasion be stopped, military spending cut, and the money diverted to clean energy and community-based planning, some proposing that ‘the trillions of dollars earmarked for economic recovery can be spent to fight climate change’ (Khor, 2008; also George, 2008). Private investors and agribusiness corporations are meanwhile looking to shape a political environment in which they might benefit from ploughing hundreds of millions of dollars into commercial ventures ranging from agrofuels to wind energy to synthetic biology and nanotechnology (Biofuels Digest, 2009a, 2009b). An odd alliance of forest conservationists, economists, traders and investment banks is mobilising to demand that hundreds of billions of dollars be put into ventures that protect carbon reservoirs in trees (Lang, 2008). Concerned physicists are taking to the airwaves to urge a Manhattan Project for fusion power (Cox, 2009), and a host of futuristic geo-engineering schemes involving mirrors in space, artificial trees, nanoparticle ocean films and the like is also under serious discussion (Brahic, 2009a). Many governments are meanwhile hoping that major climate investment decisions can be simply left to the new carbon markets that they are in the process of cobbling together.

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To what extent are any of these proposals a good idea – simultaneously effective against the causes of global warming, safe, beneficial to livelihood and fair to all social groups? In what ways might they be combined in a coherent climate policy package? The answers are complicated. Many proposed climate investments are aimed at fostering unlimited growth in consumption, which is almost certainly incompatible with the declining material throughput required to avoid crisis (Jackson, 2009). Many investments would probably make global warming considerably worse than it is already. Some might make money for some sectors for a time but then lead to another economic crash. Others might sound good in isolation but would undercut each other. Still others would benefit only a small minority, harming many others or endangering the earth. On the other hand, promoting a workable pattern of investment capable of both addressing the climate problem and benefiting society in other ways is likely to involve political tasks that frighten many environmentalists and other elites: analysing the history of the climate crisis and the role of fossil fuels in the construction of political power and economic growth; asking different communities what their own energy solutions have been in specific contexts; building movements for structural change; and ‘taking over the City’ (Minns, 1982) and Wall Street to ensure more democratic control over the architecture of finance. Given the stakes and the difficulties, as well as the hazards of missteps, a rough map of at least part of this complex terrain seems essential – one that cannot be provided by economics and climate science alone. What is living and what is dead in the idea of climate investment?

The dead

It is perhaps best to start with what is dead. Only if the corpses of deceased climate investment strategies still sprawled in plain view on Main Street are cleared out of the way and given a clean and honourable burial can public health be ensured and the ancestors properly respected. The following strategies, having been fairly plainly dead for some time, should be swiftly stretchered off the scene so that life can go on.

Investing in more fossil fuel extraction and burning is not a viable climate strategy. On the contrary, it is the main cause of global warming. As biologist Tim Flannery puts it, ‘There is so much carbon buried in the world’s coal seams that, should it find its way back to the surface, it would make the planet hostile to life as we know it’ (Flannery, 2005). The carbon locked away in underground coal, oil and gas is more than double the unstable carbon contained in living and dead biomass combined (Falkowski et al., 2000), and the ability of the oceans to take up carbon, while large, is limited, making it impossible to prevent carbon released from the burning of fossil fuels from building up the



UN Photo/Kibae Park

The carbon locked away in underground coal, oil and gas is more than double the unstable carbon contained in living and dead biomass combined.

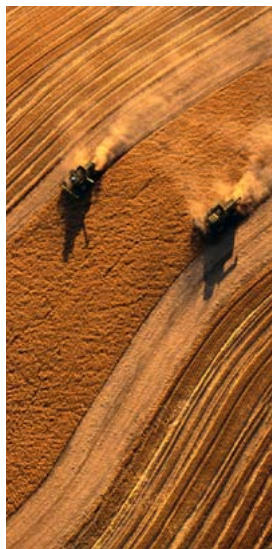
atmosphere. Investment now has to be directed toward keeping oil, coal and gas in the ground, not bringing them out.

That will entail reversing the energy finance policies and regulations of nearly all nations, banks and intergovernmental institutions: it is estimated that the assets of the fossil fuel businesses currently supported by the financial markets, if burned, would already push atmospheric levels of carbon dioxide beyond 500 parts per million. It will also mean eliminating indirect public investment in fossil fuels such as tax breaks for oil companies, the US\$300 billion that goes annually to fossil fuels in straightforward subsidies (Ban Ki Moon and Gore, 2009), and the bank-rolling of fossil fuel projects by international development banks such as the World Bank, which doubled its loans for fossil fuel development between 2007 and 2008 (Redman, 2008). Finally, it will mean calling a halt to the expansion of fossil fuel-related infrastructure, especially in the North, including airports, petrochemical installations, electricity generating plants, new highways, and so forth; hence the recent call of activists from Asia, Latin America and Africa to stop construction of further coal plants in the UK (Jowitz, 2009) and the protest of environmentalists concerned that economic stimulus plans will lock in fossil fuel dependence for additional decades (Harvey, 2009b).

Such shifts will be welcome to those who, understanding that rates of extraction must eventually begin an inevitable, terminal decline dictated by geology and technology, have long urged the need to prepare early for 'peak oil' and 'peak coal'. They will also come not a moment too soon for groups that, long before climate became a headline issue, were battling coal extraction in Appalachia or Bangladesh, 'petro-violence' (Watts, 2001) in Ecuador or Iraq, or the consequences of a global liquid natural gas economy in Mexico or the US (Zalik, 2008). As activist Nnimmo Bassey remarks of Nigeria, decades of oil extraction 'have translated into billions of dollars that have spelt nothing but misery for the masses of the people'. Cheap petrodollars 'turned Nigerian politics into a struggle for the control of the national purse and led to a massive regime of conversion of public funds and properties into private control', polluting, destroying and dislocating 'the very basis of survival of the people in the region'. 'Nigeria should not make any new oil block concessions', Bassey concludes: 'Leaving the oil underground does not translate to losses but saving... By this simple act, Nigeria would keep the equivalent tonnes of greenhouse gases out of the atmosphere. This is a foolproof step [to curb global warming] that requires no technology transfer and does not require any international treaty or partnership' (Bassey, 2009).

Investing in carbon sequestration and storage (CCS) (IPCC, 2006; *Restructuring Today*, 2009; Socolow, 2005) is no answer to these concerns. Because it also squanders finance on transferring fossil fuels out of the ground while delaying transitions to non-fossil technologies, CCS (sometimes called geosequestration) is another strategy for which last rites should have been performed long ago. Just as agrofuels help sustain oil dependence, so CCS sustains coal dependence, making global warming worse while driving up the ultimate, unavoidable cost of switching away from fossil fuels. Or perhaps it would be more exact to say that it is the *hope* of CCS that helps sustain coal dependence: the first commercial carbon capture and storage plant could not come on stream before 2030 and would require decades of research and tens of billions of dollars before the vast infrastructure needed could be deployed (Ansolabehere et al., 2007). As Vaclav Smil points out, sequestering even a mere 10 per cent of today's global CO₂ emissions would require forcing underground every year a volume of compressed gas equal to or larger than the volume of crude oil extracted globally by a petroleum industry 'whose infrastructures and capacities have been put in place over a century of development' (Smil, 2006). To be effective, the technology would have to inject 50 cubic kilometres of corrosive liquid carbon dioxide into underground 'toxic waste dumps' every day until the coal is gone and then gamble the earth's climate on the numerous unknowns connected with being able to keep it in place for thousands of years. Along the way, over 25 per cent more coal would have to be burned just to produce the energy needed to liquefy the carbon dioxide, scrub out the sulphur dioxide and mercury and, as needed, transport the product around the landscape (Freese et al., 2008). By confusing the process through which fossil fuels are formed underground over millions of years with an untried experiment involving injecting millions of tonnes of a dangerous fluid into leaky reservoirs in the earth's crust, CCS again gets its basic science wrong (Rochon et al., 2008).

Its abandonment cannot come a moment too soon for environmental justice movements battling the expansion of fossil-fuelled industries near their communities or the transport of coal or oil through them; or those suffering from coal mining or the dumping of the toxic wastes already associated with the industry. While energy companies strategise about how to manage the expected resistance to the new liquid carbon dioxide dumps (they have already coined a new term, 'NUMBY syndrome' – 'Not Under My Back Yard'), groups bearing the immediate environmental brunt of coal-dependent infrastructure are already clear about the futility of CCS. As the US group Coal River Mountain Watch says, 'We cannot afford to waste precious time and resources on this dead-end technology' (Coal River Mountain Watch, 2009).



tpmartins (flickr)

Because agrofuels are being forced to play the same role fossil fuels play in current transport and industrial technology, their requirements for land are immense.

Investing in agrofuels as a stand-in for oil is also a dead strategy, since it helps preserve the infrastructure of fossil fuel dependence, not replace it. The enormous industrial agrofuel investments being made today are intended to help power technologies designed to run on petroleum. They thus give those technologies – and the ‘petro-violence’ with which they are linked – a new lease on life at a time when they should be in the process of being replaced, and reinforce governments’ determination to rely on them until the last drop of oil has been extracted. Rather than promoting energy security, in short, industrial-scale agrofuel investments promote the security of fossil-fuel infrastructure, and exacerbate the insecurity of societies that depend on it or are re-engineered in its name. They squander an opportunity to invest in a fossil-free future that needs to be grasped quickly.

In addition, because agrofuels are being forced to play the same role fossil fuels play in current transport and industrial technology, their requirements for land are immense. Reliance on fossil fuels entails burning 400 years’ worth of plant growth every year (Dukes, 2003). To ask contemporary ecosystems to provide, year on year, a significant supplement to such a highly concentrated, accumulated source of energy places an insupportable burden on agricultural and forest lands and societies. In this sense, policies promoting investment in industrial agrofuels perpetuate the same confusion between below-ground and above-ground carbon pools that is exemplified in policies that assume that transfer from the one to the other can continue indefinitely. ‘Sustainable industrial agrofuels’ is a contradiction in terms.

Accordingly, for investors to move out of agrofuels cannot come quickly enough for those whose farmlands, forests, health and livelihoods are threatened by them in countries from Indonesia, Malaysia and Papua New Guinea to Cambodia, Cameroon, Uganda, Côte d’Ivoire and Ecuador. In Colombia, for example: ‘Vast stretches of land are given over to plantations for agrofuel; tropical forests are being cleared to plant thousands of hectares of oil palm, sugar cane and other crops... In many cases, palm plantations are expanding over the territories of displaced communities’ (WRM, 2008). With large tracts of land ‘no longer being allocated to food production’, food dependency on large multinational corporations has increased. In Choco province and in dense forests along the Pacific, paramilitary gangs formerly associated with antidrug operations are seizing Afro-Colombian land to facilitate palm oil biofuel conglomerates, murdering dozens of farmers in the process (Monahan, 2008).

Investing in other land-intensive schemes for 'compensating' for fossil fuel use is another dead strategy. Such schemes come in many flavours, but they all attempt to press biotic carbon dumps or storehouses into service to help moderate the climatic effects of extraction and burning of coal, oil and gas. Because of the quantitative and qualitative mismatch between below-ground and above-ground carbon pools, that entails investing in new forms of control over enormous tracts of land or ocean that people are already using for other purposes.

Thus elite alliances forming around the concept of REDD – 'Reducing Emissions from Deforestation and Degradation' – are proposing that billions of dollars be invested in acquiring and preserving carbon in the world's native forests. State forestry departments, conservation organisations, local authorities or indigenous peoples would be pressed into service as onsite security staff for this gargantuan biotic climate warehouse. So far, REDD advocates include ex-World Bank chief economist Nicholas Stern, who sees it, tonne by tonne, as one of the cheapest ways of keeping carbon dioxide molecules out of the atmosphere; Wall Street firms such as Merrill Lynch, which see high potential in trading such new 'carbon assets'; the UN's Food and Agriculture Organization, which welcomes it as an opportunity to expand its political role; and, often in the forefront, forest scientists, technicians and master planners occupationally predisposed to be captivated by global technical fixes.

The enormous sums of money potentially on offer have already divided various indigenous peoples' groups and local communities, some of whom see REDD as an unprecedented opportunity for advancement, whilst others see it as a potentially catastrophic enclosure movement and violation of the sacred (IEN, 2009); and environmentalists, who divide between proponents such as the US's Conservation International and The Nature Conservancy on the one hand and, on the other, groups such as FERN and the Forest Peoples Programme, who, looking to the example of the ill-fated Tropical Forest Action Plan of the 1980s and 1990s, see REDD as disempowering forest peoples in favour of acquisitive corporations and officials with little experience of or incentive to understand local issues of forest conservation (Griffiths, 2008).

Very similar, but at an earlier stage of development, are schemes to promote investment in 'biochar'. Spearheaded by scientists, technicians and start-up companies, biochar seeks to scale up to a national or continental level a little-understood ancient Amazonian burning practice that sequestered carbon in a useful mineral form, hoping thereby also to produce gas and oil substitutes (Harvey, 2009a). To make a dent in the fossil fuel problem, biochar, like agrofuels, would involve altering

land-use practices over millions of hectares in untried ways (Biofuel-watch, 2008). To representatives of the Kuna people of Central America, to whom the potential for conflict is obvious, biochar is 'bioshit'. While biochar would use fairly low-tech methods of cooking agricultural wastes, schemes are also afoot to use synthetic biology to produce oil out of biomass, providing means for transforming the widest possible range of biomass on the planet into fossil fuel 'equivalents' capable of serving a petroleum-using or coal-using technology infrastructure. That could bring additional millions of hectares into service in the quest to make current fossil fuel infrastructure safe for the climate.

Plans are being made to make extensive use of the oceans in a similar way. Ocean fertilisation to promote algal growth to absorb carbon dioxide is one option (ETC Group, 2009). Recently, proposals to bury land-grown biomass in the oceans have also been revived (Fountain, 2009). Again, because of the mismatch between underground and surface carbon pools, such attempts at technical fixes, if intended to compensate for continued use of fossil fuels, would entail planetary-scale tampering with the agricultural, soil and other livelihood systems relied upon by millions of peoples, as well as ocean fisheries. Just as Wall Street wizards were prevailed upon in recent decades to help commodify an unprecedented range of uncertainties in the service of an enormous expansion of credit and leverage (Lohmann, 2011), so technical wizards in scientific institutions are now being prevailed upon to find ways of cultivating immense biotic fields in order to maintain fossil infrastructure in the face of climate change. Both projects benefit various elites in the short term at the cost of the accumulation of concealed toxic risks.

Investment in nuclear and thermonuclear energy is a long-dead corpse and any attempt to revive it would be a disastrous waste of money. Nuclear and thermonuclear energy are no more capable of attaining their main purpose – replacing fossil fuels – than are agrofuels, although the reasons are different. The attempt to use plant harvests to mimic petroleum fails because their energy concentration is too low. To be able to play even a small part of the role of oil, agrofuel crops would need to be planted across unfeasibly large areas of land, forcing an unsustainable simplification of human and other biological communities. The attempt to use nuclear fission or fusion as a stand-in for fossil fuels, by contrast, fails largely because the concentrations of energy involved are unmanageably high. Nuclear fuel contains at least ten million times more usable energy than any fossil fuel does, yet is used in energy generating plants for nothing more than boiling water, using the kinetic energy of highly dangerous particle and gamma radiation. As Amory Lovins pointed out long ago (Lovins, 1977: 6), that is like using a chainsaw to cut butter.

None of the classic obstacles to rejuvenating nuclear energy has ever been overcome: the equipment, skills and security technology required to contain nuclear reactions; the resulting gigantic capital costs and need for huge state subsidies that drain resources from more competitive, climate-friendly options.



None of the classic obstacles to rejuvenating nuclear energy has ever been, or could ever be, overcome: the equipment, skills and security technology required to contain nuclear reactions; the resulting gigantic capital costs and need for huge state subsidies that drain resources from more competitive, climate-friendly options (Burke, 2008; Lovins and Sheikh, forthcoming); the long lead times; the dangers to the gene pool of radioactive contamination lasting tens of thousands of years; the hazards of mining raw materials; the impossibility of effective waste disposal and the enormous costs of any attempt to effect it; the squandering of scientific expertise on research and development; the threat of use of nuclear materials in weapons; the insurance required to ‘compensate’ for the dangers; the needs for surveillance and police. The idea that thousands of massively expensive and hazardous nuclear plants should be assembled quickly in order to help maintain an archaic energy infrastructure built around fossil fuels is technologically, financially, scientifically and politically ludicrous, and would meet substantial global resistance. Fusion power, meanwhile, would have to initiate and control a process capable of converting a lump of matter with the mass of a dollar bill into energy equivalent to that released by a hydrogen bomb. The specialised high-energy technology required to trigger harnessable thermonuclear reactions, involving temperatures of millions of degrees, is not even close to being developed.

Such cases point to some of the reasons why **investment involving technology transfer as currently understood** is also a defunct strategy. North–South technology transfers facilitated by standard mechanisms of foreign aid, export subsidies, foreign direct investment and so on necessarily revolve around Northern export technologies that have been developed in the shadow of fossil fuel dominance and the search for fossil fuel replacements. Technologies that are needed to overcome fossil fuel dominance tend to be neglected or suppressed. An excellent example is the World Bank’s Clean Technology Fund, advertised as dealing with climate change, which promotes coal power in the South through transfer of ‘clean coal’ technologies (which are defined as those that emit no more than a standard coal fired power station in the North) (Brahic, 2009b).

No less importantly, current conceptions of technology transfer slight the importance of technology exchange based on Southern innovation. South-to-North and South-to-South transactions are likely to prove increasingly key as the world warms further. In agriculture, for example, although no-till and permaculture movements in the North are important, the main reservoirs of knowledge on which to develop the non- or low-fossil fuel agriculture which is the key to future nutrition are located in the South. Yet ‘technology transfer’ continues to carry the connotation, as it always has, of moving Northern technology into a

‘technology-deprived’ area in the South. In practice, this typically plays out in the degradation, skewing or destruction of one set of technologies in favour of another (Mitchell, 2002).



Trees ForTheFuture

Rice terraces,
Uttarakhand, India

The irony in an age of global warming is that it is often a green technology that is degraded by a less green one. One example of how this process is encouraged by today’s international climate investment regime comes from the Bhilangana river valley in mountainous Uttarakhand, India. The low-carbon irrigation system of Sarona village uses porous rock dams to divert water gently into small canals while letting silt through. The water then flows into still smaller channels feeding terraced rice and wheat fields that then discharge any remaining water back into the river. This well-established, low-carbon system, like many others in the region, is under threat from a 22.5 megawatt run-of-the-river hydropower system being built by Swasti Power Engineering with prospective Kyoto Protocol carbon finance (UNEP and Risoe Centre, 2009). Knock-on effects would include loss of livelihoods, migration and loss of a type of knowledge that, ironically, will be especially valuable in a greenhouse world. Sarona residents were never consulted and first learned about the project only in 2003 when construction machines arrived. Some 146 similar dam projects are proposed or underway in Uttarakhand alone (Ghosh and Kill, forthcoming).

No matter how closely a technology investment scheme hews to a mathematical notion of ‘equality’, it will inevitably be skewed by Northern and fossil fuel biases if it shies away from historical or political economy analysis of ‘technology transfer’. One example is the ‘Greenhouse Development Rights’ framework, with its tacit endorsement of a long-discredited concept of ‘development’ that sees ‘resilience’ as ‘far beyond the grasp of the billions of people that are still mired in poverty’ and singles out for special climate blame ‘subsistence farming, fuel wood harvesting, grazing, and timber extraction’ by ‘poor communities’ awaiting Northern tutelage in capital flows, social networking, carbon trading and methods for holding policymakers accountable (Baer et al., 2008). Similarly, thinking about climate investment by the United Nations Framework Convention on Climate Change (UNFCCC) and the European Community – which envisages a scaled-up carbon market, including a trade in REDD credits, supplemented by a modicum of public finance channelled largely through existing institutions – reveal not the slightest understanding of (nor, more importantly, any particular interest in) the extent, nature or impact of Northern and fossil fuel biases in climate change mitigation technology investment (Commission of the European Communities, 2009; UNFCCC, 2008).

None of this is to suggest that green technologies developed in the North could not contribute to a global regime of technology exchange and investment in which dispersal and appropriate local adaptation were facilitated to the greatest possible extent in the service of mitigating climate change. But that regime would be in many ways the antithesis of the one currently in effect, and of the one assumed to be inevitable in the proposals of the UN, European governments and various development organisations. Due partly to the political organising efforts of powerful transnational corporations (Drahos, 2002; Lessig, 2004), current technology transfer is based on the premise that for innovation and creativity to be optimised, they must be commodified to the maximum extent possible. Any uncompensated benefits that one person's creativity might provide to another, it is assumed, must be 'internalised' through intellectual property laws. This entrenched neoclassical extremism, which contrasts sharply with the customary sharing of vernacular technologies (Illich, 1983) and flies in the face of abundant evidence that the more uncompensated benefits that an invention or initiative generates, the more knock-on innovation takes place as a result,¹ strongly militates against locally-useful adaptations and assimilations of Northern technologies that could reduce or prevent dependence on fossil fuels. Instead of the needed 'commons of ideas' that would foster the maximum multiplication of benefits from climate-friendly technologies, the world of trade today is characterised, to adapt the words of innovation experts Brett Frischmann and Mark Lemley (2006), by 'too much intellectual property protection and too few spillovers'.

The political obsolescence of such neoliberal intellectual property doctrines in an age of global warming is signalled vividly in the reaction of a Chinese information technology (IT) industry employee to a recent presentation of a Chinese scholar and climate campaigner:

If global warming is really as serious a threat to human civilization as you are saying, then where is the open source movement for the climate? I am an active participant in the free software movement. Every week I spend more than 10 hours of my free time on it, like millions of other tech guys around the world. We all understand that the free software we help to create and distribute probably hurts the profit margin of the whole IT industry. But there are more important things in life than making money at all costs. So this is what we do to make the world a bit better and more fair. Unless I see a comparable

1 For some of this evidence, see Audretsch et al. (2005); Bernstein and Nadiri (1988); Cohen and Levinthal (1989); Gilson (1999); Griliches (1992); Harhoff (2000); Jacobs (1988); Ramello (2005).

movement for the climate, I will always suspect that you guys are just another interest group, and the whole climate change thing might be some hype to sell certain kinds of proprietary technology from the West (cited in Wen, 2009: 31).

Of course, there already are equivalent, unofficial ‘open source movements for the climate’ in the form of innumerable independent community and non-governmental efforts eager to share their discoveries and insights globally. But until governments learn to support such initiatives more and thwart them less, promises of climate-friendly ‘technology transfer’ are likely to remain hollow.

The current counterproductive regime of ‘climate technology transfer’ has also been heavily influenced by skewed methods of energy planning and demand forecasting developed during the age of fossil fuels and then used by national energy bureaucracies for their own purposes. A study led by Paul Craig of the University of California (Craig et al., 2002) reveals that US forecasts have historically overestimated US energy demand. The results have included overproduction, reduced prices and overconsumption of fossil fuels and their ‘substitutes’. Scholars and activists such as Chuenchom Sangasri and Chris Graecen (Chuenchom and Graecen, 2004; Graecen, 2004) show how US-dominated frameworks of energy planning giving pride of place to fossil fuel use and highly centralised generating plants have interacted destructively with political interests in other countries as well (see also Perkins, 2004).

Carbon trading is one final bloated corpse that needs to be hoisted into a hearse and whisked away quickly before it poisons genuine investment initiatives. Carbon markets, as developed in the Kyoto Protocol, the European Emissions Trading Scheme (EU ETS) and various other programmes and exchanges, were occasionally advertised by the derivatives traders and neoclassical economists who invented them (Lohmann, 2010a) as a means for incentivising and providing finance for a transition to a fossil fuel-free future. In their decade of existence, however, they have done precisely the opposite, by offering the heaviest fossil fuel polluters in industrialised societies new means for delaying the steps toward structural change that need to be taken immediately, while simultaneously providing supplementary finance for fossil-intensive industrial pathways in the South.

In order to function, carbon markets translate climate change mitigation into measurable greenhouse-gas ‘emissions reductions’. That is the only way to reconstruct climate benefit as tradable units: discrete, divisible, determinate, quantifiable, commensurable, additive and incre-

mental. Universally fungible greenhouse gas pollution rights are backed by an implicit government guarantee that an optimal ‘climatically safe’ amount of total rights in circulation can, in principle, be specified and mandated. Governments set supply levels (‘caps’) that supposedly progressively approach this ‘safe’ level and either sell the commodity or, more usually, give it away free to large industrial polluters. Trade in the product then supposedly makes climate change mitigation maximally cost-effective. For added cost savings, a second class of quantified climate-benefit units called ‘offsets’ is then developed and added to the pool of commodity ‘reductions’. These offsets are manufactured by special projects that are claimed to result in less greenhouse gases accumulating in the atmosphere than would be the case in the absence of carbon finance. Examples include tree plantations (which are supposed to absorb carbon dioxide emissions); fuel switches; wind farms; hydro-electric dams (which are argued to reduce or displace fossil energy); and projects to burn off methane from coalmines, waste dumps or pig farms. Proposals to use agrofuels, biochar, REDD, ocean fertilisation, CCS and nuclear energy to generate greenhouse gas pollution licences for sale to rich countries or firms – proposals that would cement the links between these various technologies and the fossil fuel economy – are also being considered under various carbon trading schemes.

Abstracting from place, technology and history, carbon trading achieves its ‘economies’ by putting off technological change and investment in a long-term non-fossil future. It confuses ‘investment’ in the sense of ‘short-term money-making venture’ with ‘investment’ in the sense of ‘foundation for a secure future’. Suppose, for example, a country promulgates a law that progressively scales down the electricity utility sector’s emissions to a point at which it will have to invest in non-fossil generation. Carbon trading, if also introduced, lets the industry delay that investment by allowing it to buy cheap pollution rights from sectors that have overshot their own targets using technologically easy cuts that contribute little to a historical trajectory away from fossil fuels. Or it allows generators to buy further delays by acquiring still cheaper ‘offset’ credits from, say, companies burning off methane from waste dumps in Brazil or coal mines in China or achieving routine efficiency improvements at sponge iron plants in India. In this way, carbon trading encourages more ingenuity in inventing measurable ‘equivalences’ between emissions of different types in different places, or between emissions reductions and various kinds of offsets, than in fostering targeted innovations that can initiate or sustain a historical trajectory away from fossil fuels (the effectiveness of which is less easy to measure). Indeed, once the carbon commodity has been defined, merely to weigh different long-range social and technological trajectories or evaluate and ‘backcast’ from distant goals is already to threaten the efficiency imperative.



The money paid for the pollution rights (and billed to German electricity customers) does nothing to reduce China's emissions, either, nor does it help in its transition to a fossil-free future: the dams do not replace fossil-fuelled generation, but merely supplement it, and were arguably going to be built anyway.

A case in point are the 763 Chinese hydroelectric dams that have applied or are planning to apply to the United Nations to be allowed to sell more than 300 million tonnes of carbon dioxide pollution rights to Northern industry. By buying such rights, corporations such as Germany's RWE are able to avoid investing in less polluting electricity generation at home. A mere thirty-eight of the Chinese dams are expected to produce enough carbon credits to allow Germany to relax its emissions restrictions by more than 1 per cent by 2012. Yet the money paid for the pollution rights (and billed to German electricity customers) does nothing to reduce China's emissions, either, nor does it help in its transition to a fossil-free future: the dams do not replace fossil-fuelled generation, but merely supplement it, and were arguably going to be built anyway. Construction at Xiaoxi dam, for example, got under way in 2004, two years before the developers applied for CDM credits. The project design document notes that it would be against Chinese regulations to build an equivalent coal-fired plant on the site, yet planners claim that the project is 'saving' carbon equal to the difference between the emissions of a coal-fired installation and those of the dam (McDonald et al., 2009).

The US Government Accountability Office warned recently that such carbon projects could allow industries in the North 'to increase their emissions without a corresponding reduction in a developing country' (GAO, 2008). The project of finding 'cost-effective' ways of investing in climatic stability through carbon markets entails losing touch with what is supposedly being costed. For over 10 years, the main product of carbon markets has been procrastination. Whatever small emissions cuts may have been made under the Kyoto Protocol or the EU ETS (which are unmeasurable in principle due to the system's contamination with offsets) are made through their regulatory components, not their trading components. At the same time, trading has blocked long-term progress away from fossil fuel dependence, locking in future increases in emissions.

Like the strategy of investing in agrofuels and CCS, the misguided investment strategy that would have carbon markets 'sort out' global warming (Scott, 2008) damages more than just climatic stability. 'Nobody asked if we wanted to move,' said a 38-year-old man whose family lost a small brick house to the Xiaoxi dam. 'The government just posted a notice that said, "Your home will be demolished".' While the dam company says local surveys found overwhelming support for the project, with 97 per cent of 212 respondents saying they were satisfied with their compensation, people interviewed in Xiaoxi said they were not contacted for the surveys. The German carbon firm Tuv-Sud, which validated the project for the UN, admitted that 'the concerned villagers and their leaders were not involved in the decision process'. But it contended that the 'essence' of European guidelines on participation

was fulfilled because those affected ‘have improved their living environment’, although many villagers did not get enough money even to buy new homes (McDonald et al., 2009).

It is not only communities fighting damaging industries in the South that sell carbon credits who bear the impacts of carbon markets. Communities on the fenceline of polluting industries in the North suffer them as well – which is why it is unsurprising that California’s environmental justice movement, weaned on struggles against the disproportionate effects of industrial contamination on poorer communities of colour, ‘stands with communities around the world in opposition to carbon trading’ (California Communities against Toxics et al., 2008). Many indigenous peoples’ organisations, meanwhile, strongly oppose the way carbon markets have enclosed, privatised and commodified the earth’s carbon-cycling capacity, or ability to keep its climate stable (Goldtooth, 2009; Sommer, 2009). Various green energy developers in both South and North are concerned about the way carbon markets are blocking progress in the spread of renewables (Hankins, 2009; Solarenergie Forderverein, 2009).

The living

Respectfully clearing the dead from the streets opens a space for the living. But what kind of climate investment is it that will make possible a human future?



It is not enough simply to invest in non-carbon energy and non-carbon transport, sustainably heated houses or reduced-oil agricultural techniques. Plenty of financial institutions are already doing that, while continuing or even increasing their investment in fossil fuels.

First, it is not enough simply to invest in non-carbon energy and non-carbon transport, sustainably heated houses or reduced-oil agricultural techniques. Plenty of financial institutions are already doing that, while continuing or even increasing their investment in fossil fuels – the World Bank, for example. Nor will it be enough just to stop investment in fossil fuels, although that is part of the solution. Rather, successful climate investment will go into **creatively building long-term, coherent historical pathways away from dependence on fossil fuels**. That is different, and more complicated, and has far-reaching consequences. For example, it means rejecting investment in carbon trading systems as the foundation of climate policy, since such systems do not select for a livable future history, but rather for short-term cost savings on slightly modified business-as-usual pathways.

Second, the new pathways that must be the objective of climate investment will lead industrialised societies not only away from coal, oil and gas, but **also away from the search for fossil fuel substitutes**. Nothing else – not agrofuels, not nuclear energy, not wind farms – can play the role that fossil fuels play in today’s industrialised societies, including their political role of powering the machines that shape elites’ struggles

against the poor (Caffentzis, 2008), and it is futile and enormously expensive to pretend that they can. The hope that a replacement for fossil fuels can be found that will allow everything else to remain exactly as it is has to be abandoned. Assumptions about demand, energy planning, development and social control that derive from the fossil age and its politics are of little use in a greenhouse world. It is not only fossil fuels that must be left in the ground, but also the practices and institutions that have made their extraction and burning possible and even necessary. Again, it follows that carbon markets cannot be a part of intelligent climate policy, since they are designed in a way that extends the life of fossil fuel-oriented infrastructure.

Third, the future of climate investment belongs, instead, to **locally focused energy, locally adapted agriculture and locally appropriate transport**. In agriculture, for example, the inefficiencies and simplifications that petroleum allowed now have to be set aside by a myriad of intricately-differing local practices that constitute the necessary condition for high yields without oil. As the anthropologist Richard O'Connor once pointed out, 'the environment itself is local; nature diversifies to make niches, enmeshing each locale in its own intricate web. Insofar as this holds, enduring human adaptations must also ultimately be quite local' (O'Connor, 1989). In this new, lower-energy context, more than ever before, '[t]he only frameworks that can tell you anything about the likely efficacy of a policy are those at the most local level', to cite the words of Michael Thompson and colleagues. 'What is needed is...an approach that places the "mere details"...at the very centre of the stage and relegates to the wings the alarm bell-ringers and their immaculate prescriptions' (Thompson et al., 1986: 71, 87–8). A post-fossil agriculture more attuned to local capabilities may or may not entail more drudgery. But one thing it will certainly require is a rediversification and decentralisation of knowledge, a turn toward the gardening side of farming in millions of separate locales. Future trade in agricultural goods will be built on bases of increased respect for and individual attention to local particularities.

To a lesser extent, the same is true of post-fossil fuel energy generation, and indeed of post-financial crash investment generally. As another anthropologist, Stephen Gudeman, observes with respect to the financial crisis, instead of merely 'helping occupants at the top of the prestige and power scale (Wall Street or the financial realm)', emergency investment also needs to be directed toward the communal 'base' maintained by ordinary people – an arena of 'the things and services with which we live and by which we make our relationships with others', including things and services obtained by trade for purposes of resilience rather than speculation: housing, living spaces and so forth (Gudeman, 2008). In short, cli-

mate investment must be directed more toward building and maintaining diverse baskets of concrete incommensurables than toward the indefinite processes of commensuration that serve mainly to expand liquidity, credit, capital velocity, uncertainty and trade in fictional commodities.



Shift... What is required is a different knowledge process.

Fourth, this will entail a **shift in the types of knowledge** used in making investment decisions. Hitherto, investment planning has typically been built on, for example, abstractions regarding ‘future energy demand’, formulated by institutions such as the International Energy Agency, that rest on the assumptions that all remaining fossil fuels will be taken out of the ground, and that afterwards ‘substitutes’ for fossil fuels will be used. These claims, when acted upon, result in the accumulation of a particular kind of knowledge: how many tens of thousands of nuclear plants will have to be built; how many becquerels of radioactive waste will need to be guarded for how many thousands of years; how many millions of hectares of land will need to be taken over for gigantic solar arrays or the production of agrofuels and biochar; how all this can be done at the least cost to the corporate sector; and so forth. This accumulating knowledge finds its home in a cascade of conflicts, mishaps, technical fixes and accretions of yet further technical knowledge, as for example when ‘second generation’ cellulosic agrofuels emerge from the ashes of the ‘first generation’. All this leads in turn to the build-up of techniques for commodifying and ‘managing systemic risk’ – techniques whose historical blindness and technical inadequacy have again been revealed during the current financial crisis.

In the end, this snowballing of ultimately useless climate investment knowledge tends to flatten other kinds of knowledge that will be more at a premium in a warming world – in particular, knowledge of resilient means differing communities might deploy in order to lead satisfying, mutually-acceptable lives without entailing the global threats and power differentials associated with fossil fuels or fossil fuel substitutes. What is required is a different knowledge process, one in which more assumptions (including those about energy demand) are opened for concrete questioning, and in whose creation more and different communities with different starting assumptions can be involved. One modest example from Europe is the Transition Towns movement, which is going some way toward rethinking demand with its ‘Energy Descent Action Plans’, even if it still lacks a political economy analysis of industrial energy use or an organisational focus on equitable energy distribution. In Indonesia, similarly, the Institute for Democratic Economics is facilitating sweeping reinvestigations and reformulations of energy and livelihood issues by dozens of communities on different islands of the archipelago, deriving conclusions and agendas that fly in the face of neoliberal orthodoxy.

None of this implies that there will be no place for expert assistance in climate finance decisions. But it will come not only from fields such as economics, finance, climate science and engineering (Lohmann, 2010b). Specialists in other areas as well must pitch in to help liberate the climate debate from the neoliberal straitjacket in which it has become encased. Historians, for example, can help analyse how structural change has been peacefully brought about in the past. Anthropologists and sociologists can help expose, disassemble or put in perspective destructive assumptions and practices implicated in commodification, imperialism and economic growth doctrine, as well as document existing resources for climate change solutions. Legal scholars can help highlight environmental protection instruments whose virtues have been eclipsed by neoliberal fervour (Driesen and Sinden, 2009), and so on.

All this will require, *fifth*, that state bureaucracies, research institutions, banks and other financial institutions be forced to make space for more investigation and discussion of **how various communities and societies already support themselves without overreliance on fossil fuels**; to move toward greater humility in their assessments of what is possible and not possible; and to stop shying away from acknowledging the centrality to climate investment of issues of class, colonialism, race, local geography and the politics of knowledge. It will also entail that limits be put on the overreaching, counterproductive attempts to commodify innovation enshrined in current intellectual property law (Frischman and Lemley, 2006).

Sixth, most financial, corporate and government leaders will not be able to find their own way to these realities, or to successful climate investment policies. Their place in society has been carved out and sustained by fossil fuels and fossil fuel substitutes and by the economic and political practices that most need questioning. Hence the **leaders themselves will have to be led by a popular movement**. It follows that activism for successful climate finance cannot be just about urging globally-agreed targets for greenhouse gas reductions, offering a checklist of acceptable technologies, constructing new commodities, and then delegating investment to traditional financial institutions and governments – however reformed and regulated – who will then try to get prices right while keeping structures of power and knowledge much as they are. It will be much more about building a political movement for broad-based, democratic, post-fossil, long-range social planning based on co-operative inquiry. Broad social change is inevitable; the unrestrained attempts of the past few decades to commodify uncertainty, innovation and carbon-cycling capacity will have to be curbed sharply. Ways must be sought to find and enforce democratic consensus about what resources must be shared



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In climate as in other fields, the economic crash offers the opportunity to transform finance into a force for livelihood and survival, but the struggle to make that happen will be ongoing.

where and when, for long-term collective benefit; what institutions will accordingly have to be phased out and what new institutions constructed to take their place; and how the political transition is to happen. Without this democratic process, supposed ‘Green New Deals’ are likely to be destructive of livelihoods and climatic stability alike. As some 300 development and environment organisations recently insisted in a statement on the proposed Global Climate Fund, investment governance ‘must be democratic, transparent, and accountable to all, especially the impoverished and vulnerable communities most affected by global warming... Civil society groups, social movements and indigenous peoples, from developing and developed nations, must be formally represented within all governance structures’ (IFG, 2008: 2).

Seventh, that can only happen through a process that involves ‘taking over the City’. The historian E.P. Thompson remarked years ago that it has always been hard to understand the concept of the commons using capitalist categories (Thompson, 1990), and there is no reason to suppose that a workable, realistic pattern of climate investment can even be investigated properly, much less carried out, before there is much **more shared public control over finance**. That entails not just state takeover of a financial sector that has ballooned so destructively during the past few decades (Lanchester, 2009; Panitch and Konings, 2009), but also thorough democratisation of financial decision-making structures, particularly those that are important in determining long-range energy and transport development. Some of the experience needed for the necessary transformations is already being built up in the course of the campaigns for change that have emerged in the wake of the financial crisis. These include campaigns to reduce the overwhelming influence of Wall Street on Washington; increase workers’ and farmers’ participation in management; disallow banks’ claims about the value of the ‘toxic’ assets they hold; roll back limited corporate liability; challenge shareholder primacy; halt public handouts for CCS and nuclear development; force the World Bank to obey its review panel’s recommendations to stop investing in fossil fuels; get the Royal Bank of Scotland out of oil; seek tax justice; institute a maximum wage; stop the propertising and piracy of ideas and innovations that should be held in common; and so forth. Even US ruling elites are feeling the heat. What will be more difficult is following through on such initiatives without being distracted by predictable elite defences involving attempts to replace fossil fuels with new high-tech alternatives, pour yet more public cash into insolvent private banks, make minor technical modifications to the regulation of finance, or retool carbon markets. In climate as in other fields, the economic crash offers the opportunity to transform finance into a force for livelihood and survival, but the struggle to make that happen will be ongoing.

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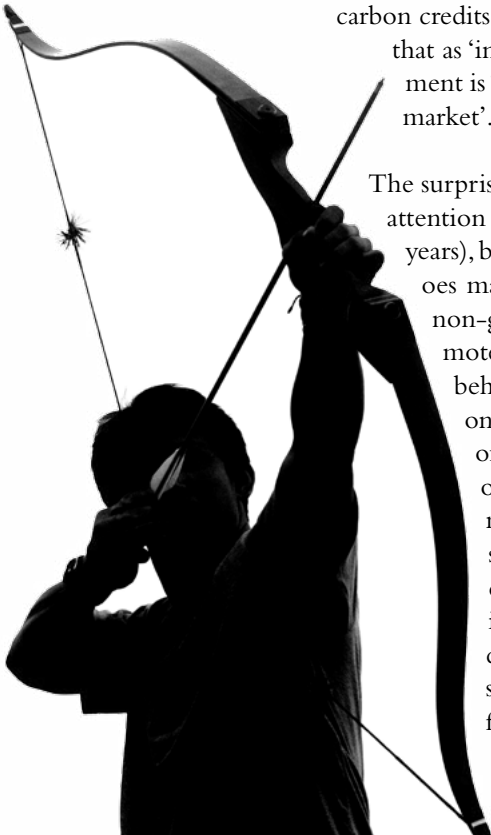
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What goes up must come down – Carbon trading, industrial subsidies and capital market governance

Oscar Reyes

When financial services products are advertised in the UK, a government health warning provided by the Financial Services Authority (FSA) issues a reminder that '[t]he value of investments may fall as well as rise'. But sellers are often not so cautious when it comes to offering carbon credits, prompting the FSA to issue a factsheet with the strapline: 'Find out why you should be wary about investing in the carbon credit market' (Financial Services Authority 2011). It draws attention to unscrupulous salespeople who call out of the blue, offering carbon credits as "the new big thing" in commodity trading', claiming that as 'industries now have to offset their emissions' and government is 'focusing on green developments' this is 'an ever growing market'.

The surprising thing about the warning is not so much that it draws attention to carbon fraud (which has been prevalent in recent years), but that the language chosen by the fraudsters closely echoes many of the claims made by the governments, businesses, non-governmental organisations and academics that have promoted carbon trading (Deloitte, 2010; Chan, 2010). The idea behind the scheme is that a market is created to put a price on carbon, which is a way to 'internalise' the economic cost of climate change onto company balance sheets. As limits on greenhouse gas emissions grow, spurred on by internationally binding emissions limits, the supply of carbon should become scarcer, pushing prices up. The resultant carbon price will act as an incentive for businesses to invest in cleaner technology. Most investment banks and carbon market specialists held something akin to this assumption, as can be see in Figure 1, which illustrates their forecasts for the future price of carbon.



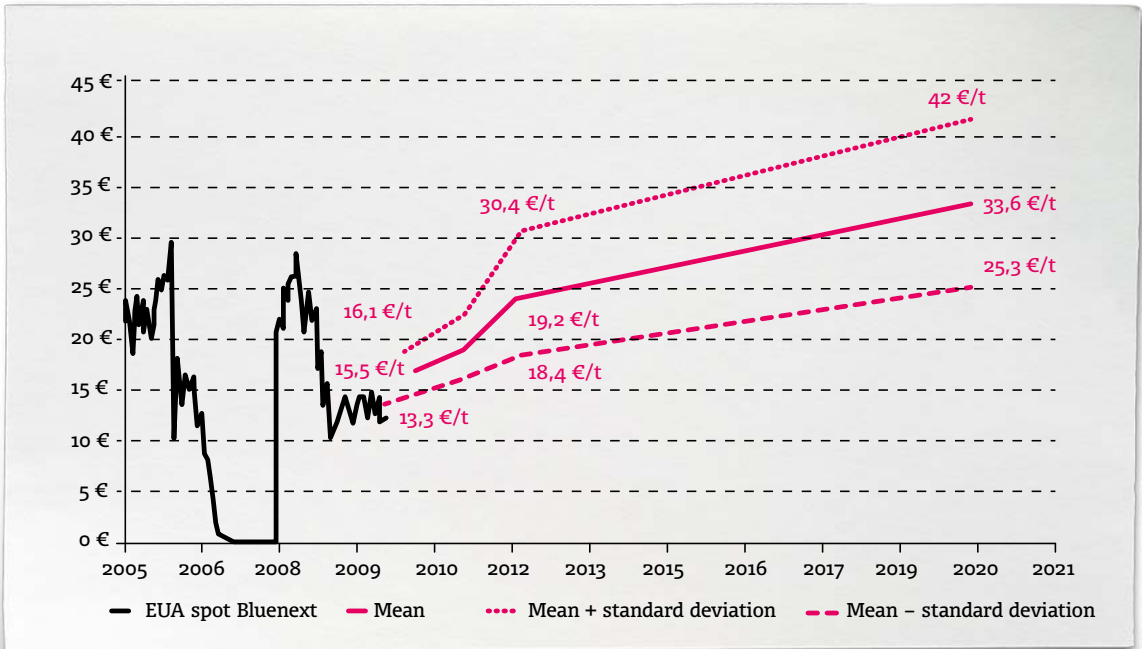


Figure 1. Trend of price forecasts for European emission allowances. (Prada, Barb  ris and Tignol, 2010: 35).

It has not worked this way in practice, however. The optimistic forecasts in Figure 1 were made in mid to late 2009, just months after the carbon price had halved (from a peak of €31). Since then, it has crashed again, with permits from the European Union Emissions Trading System (EU ETS), which accounts for over 80 per cent of the global market, falling below €6.50 each. This led a senior climate change advisor to Shell oil company to warn of ‘a vicious downward spiral’, while the CEO of German utility E.ON, one of the largest players in the scheme, was even more blunt: ‘The ETS is bust, it’s dead,’ he said, adding that it gave no signal for low-carbon investment (Krukowska 2012).

How could the theorists and market practitioners have got it so wrong? In suggesting that a carbon price should incentivise clean investment, and that a market is the most efficient means to allocate that price, proponents of carbon trading have followed a narrowly economic view of the climate change problem, taking little account of the complexities of commodity-formation, or the regular trumping of environmental goals by competition and trade policy in the allocation and rule-setting around carbon allowances.

This article offers a different account, arguing that the collapse in carbon prices is symptomatic of deeper flaws in the attempt to commodify ‘carbon’ as a solution to climate change. The first two sections look at the two main types of carbon trading – ‘cap and trade’ and ‘offsetting’.

An outline of the performance of the EU ETS, the largest cap and trade market, shows that the scheme has failed to place any meaningful



The vast majority of carbon permits have been handed out for free, with companies passing on the costs as though they had paid for them. The combined profits from this accounting trick, plus the sales of surplus permits, mean that the Emissions Trading System has mainly served as a subsidy scheme for industry and the power sector.

limit on emissions, instead generating a surplus of permits to pollute that has collapsed the carbon price. The vast majority of carbon permits have been handed out for free, with companies passing on the costs as though they had paid for them. The combined profits from this accounting trick, plus the sales of surplus permits, mean that the ETS has mainly served as a subsidy scheme for industry and the power sector.

The second part then looks at the Clean Development Mechanism (CDM), the world's largest offsetting scheme, which was created by the 1997 Kyoto Protocol. Carbon offsets are created when a company supposedly removes or reduces greenhouse gas emissions. It receives credits for this activity, which can be sold to polluters who want permission to pollute more. One activity is intended to 'compensate' for the other, but the basis upon which credits are created is a counterfactual that is nearly impossible to measure: 'Offsets are an imaginary commodity created by deducting what you hope happens from what you guess would have happened' (Welch, 2007). Moreover, the investment uncertainty surrounding carbon prices has contributed to the fact that carbon credits rarely drive investment, but generally subsidise projects that would have happened regardless. Economies of scale, moreover, have tended to concentrate these projects around a handful of heavy industries and, increasingly, around unsustainable forms of power generation – throwing a lifeline to fossil fuel infrastructure in both developed and developing countries.

The third section looks at how carbon is traded. Although prices have declined, market volumes are growing modestly as a result of increased hedging against other commodities and financial speculation. The emergence of an increasingly complex trading infrastructure is the true 'governance' challenge that carbon markets pose: concentrating power in the hands of a small number of financial sector actors and financialised utilities, while subordinating investment decisions on clean development to strategies that remain based on fossil fuel extraction and trading.

The fourth, and final, section of the article briefly sketches an alternative framework that could stand in place of the varying objectives of carbon trading.

Cap and trade: the EU Emissions Trading System

Under cap and trade schemes, governments or intergovernmental bodies set an overall legal limit on emissions in a certain time period ('a cap') and then grant industries a certain number of licenses to pollute ('carbon permits' or 'emissions allowances'). Companies that do not meet their cap can buy permits from others that have a surplus ('a trade'). The idea is that a scarcity of permits to pollute should encourage

their price to rise; and the resulting additional cost to industry and power producers should then encourage them to pollute less.

The European Union Emissions Trading System (EU ETS) is by far the largest such scheme, accounting for 81 per cent of the global carbon market, and covering almost half of the EU's CO₂ emissions (Kossov and Guigon, 2012: 17).¹ It sets an overall legal limit on the CO₂ emissions of over 11,000 power stations, factories and refineries, and since January 2012 has also included CO₂ emissions from flights between European countries, as well as into and out of the EU. Each 'installation' covered by the scheme receives for free, or buys, permits to pollute called European Union Allowances (EUAs).



For six of the seven years in which the EU ETS has been in operation, the number of allowances circulating has exceeded the 'cap'. In other words, the 'cap' did not cap anything and the price collapsed.

For six of the seven years in which the EU ETS has been in operation, the number of allowances circulating has exceeded the 'cap'. The first phase of the scheme, which ran from 2005 to 2007, saw too many permits handed out, with an overall surplus of about 4 per cent of the total emissions covered by the scheme.² In other words, the 'cap' did not cap anything and the price collapsed.

A similar problem is being repeated in the second phase of the scheme (2008–2012), as the combined effect of the economic downturn and generous provisions for the purchase of offsets. Although the absolute figures show EU emissions declining – by 8 per cent since 2005, according to the European Commission – it requires a considerable leap of faith to claim this decline as being caused by the scheme (European Commission 2011). In part, the fall is part of a trend towards industrial outsourcing outside of Europe. This pre-dates emissions trading and is driven mainly by labour market factors and trade policy (Peters et al., 2011: 3, 5).

It also reflects falling production as a result of the European Union's economic difficulties since 2008. Allocations under the ETS were made on the assumption that European economies would keep growing. But a recession followed by economic stagnation has reduced output and power consumption, leaving companies with a surplus of permits. Since these were mainly given out for free, the net effect is directly opposite to the scheme's theoretical intention: polluters can delay taking action by cashing in unwanted permits, while the over-supply means that the 'price signal' that is meant to affect change has been neutered.

- 1 The EU ETS covers 30 countries: the 27 members of the European Union, plus Norway, Iceland and Lichtenstein. Negotiations are underway for Switzerland to join the scheme (European Council, 2010). The scheme includes most of the largest single, static emissions sources, including power and heat generation, oil refineries, iron and steel, pulp and paper, cement, lime and glass production.
- 2 The 2005–2007 surplus ran to 267 MtCO₂e (Megatonnes Carbon Dioxide Equivalent, the internationally recognised measure of greenhouse gas emissions).

The latest data, for 2011, clearly bear this out. Emissions for sectors covered by the scheme dropped by 2.4 per cent over the year, which the European Commission heralded as a ‘good result [which] shows that the ETS is delivering cost-effective emissions reductions’ (Lewis and Chestney, 2012). For that claim to be true, however, it would need to establish both that companies involved in the scheme were buying permits to cover a shortfall, and that the cost of these permits was sufficiently high to affect operational and, ultimately, investment decisions. The same Commission figures reveal a 900 million surplus in permits (so far) in the second phase of the ETS, which means that a significant quantity of permits will be carried over into the post-2013 period.

Meanwhile, carbon prices collapsed to their lowest-ever levels in 2011, ending the year at around €8 per tonne. Investors were blunt in their assessment: ‘The EU ETS was expected to support emission reductions by catalysing innovation and driving investment in low carbon solutions. This is not happening’ (Murray, 2012).³

The inclusion of carbon offsets in the EU ETS (and almost all other existing or planned schemes) has compounded these problems. While cap and trade in theory limits the availability of pollution permits to trading between polluters, offset projects are a license to print new, even cheaper and less regulated ones. If all of the offset credits legally available for use in the second phase of the EU ETS were taken up, these would more than cancel out any ‘cap’ on emissions (National Audit Office, 2009: 19).

In practice, the scheme has a surplus of carbon permits even without the use of offsets, so many companies will ‘bank’ credits for use at a later date, meaning that no domestic reductions will be needed until at least 2018 (Morris, 2011: 16). Most of these offsets are used by larger installations, three-quarters of which actually had a surplus of permits to start with (Elsworth, Worthington, Buick and Craston, 2011; Trotignon, 2011). With prices slumping, there has even been a marked increase in the use of offsets – due, in part, to the fact that they remain cheaper than EUAs, but also reflecting a rush to use credits from controversial CDM industrial gas projects, which the EU’s climate action commissioner, Connie Hedegaard, admits have a ‘total lack of environmental integrity’ (Carrington, 2010). These will no longer be eligible for use in the EU scheme after April 2013.

Once the oversupply of permits and the glut of offset credits are taken into account, European Commission figures suggest that there could be up to 2.4 billion surplus emissions allowances in the scheme over the 2008–2020 period (Point Carbon 2012).

3 See Calel and Dechezlepretre (2012) for a statistical analysis backing up the claim that EU ETS has failed to induce shifts to low-carbon technology.

Polluter subsidies

The EU ETS has also acted as a subsidy scheme for polluters, with the allocation of permits to pollute more closely reflecting competition policy than environmental concerns.

A two-step process has seen polluters benefit in different ways. Energy-intensive industry has routinely been given extremely generous allocations of permits – a structural surplus of between 20 and 30 per cent, in the case of the steel sector. The value of this over-allocation to industry in phase II of the ETS was estimated (in 2010) at €6.5 billion, although the eventual figure is likely to be a bit lower, depending upon how many of the surplus permits were actually sold before a further collapse in carbon prices (Morris and Worthington, 2010: 26).

Rules governing the inclusion of 'new entrants' to the scheme also resulted in generous award of free certificates for hard lignite plants, which has contributed significantly to a 'dash for coal' in German power production.

The Bełchatów lignite-fired power station in Poland.



placid casual (flickr)

These unearned subsidies for industry have been achieved by setting relatively more stringent caps in the power sector, on the assumption that it is not particularly exposed to international competition and can simply pass on the 'cost' of allowances to electricity consumers. In so doing, the power sector wins too – and wins big. In 'passing through' to consumers the cost of allowances that were handed out for free, the utilities companies gained an estimated €19 billion in windfall profits for phase I, and stand to gain an estimated €23 to €71 billion for phase II of the ETS (although the collapse of the carbon price may reduce these figures below the €20 billion mark) (Ellerman, Convery and Perthuis, 2010: 326; Point Carbon Advisory Services, 2008).⁴ Rules governing the inclusion of 'new entrants' to the scheme also resulted in generous award of free certificates for hard lignite plants, which has contributed significantly to a 'dash for coal' in German power production (Pahle, Fan and Schill, 2011: 12).

⁴ See also Sijm, Neuhoff and Chen (2006) for evidence that electricity generators were able to generate windfall profits by passing through opportunity costs. A recent assessment of the German electricity sector suggests that the five largest companies may have benefited to the tune of €40 billion (Hermann et al., 2010).

Despite repeated claims from energy-intensive manufacturing industries that they could not pass the costs of emissions allowances through to product prices, this very same trick has also helped manufacturing companies gain unearned profits from the scheme. Econometric analysis by CE Delft found that fossil fuel refineries and the iron and steel sectors routinely passed on the entire notional ‘cost’ of EUAs – which they received for free – to consumers. The windfall profits received by these sectors in the first phase of the scheme were estimated at €14 billion (bringing the total subsidy, including over-allocated permits, to over €20 billion) (Bruyn et al., 2010).

The third phase of the ETS will continue to see significant subsidies paid to industry, despite the auctioning of permits in the power sector. Industry lobbying has resulted in over three-quarters of manufacturing receiving free permits, which could yield at least €7 billion in windfall revenues annually. Energy companies successfully lobbied for an estimated €4.8 billion in subsidies, mostly for carbon capture and storage (CCS, a cover for new coal plants). In addition, the European Commission is reviewing ‘state aid’ rules with a view to granting direct financial subsidies to companies claiming that the ETS damages their competitiveness (Reyes, 2012).

Carbon offsets: The Clean Development Mechanism

Carbon offsetting is based on ‘emissions-saving projects’ that are created to ‘compensate’ for continued pollution in industrialised countries. As seen above, offsetting usually runs in parallel with cap and trade schemes and generates credits that allow companies to pollute above the set limits. By far the largest offset scheme is the Clean Development Mechanism, which was established to give rich countries ‘flexibility’ in delivering their emissions reductions obligations under the Kyoto Protocol. The CDM has over 4,000 projects registered to date, with a similar number awaiting approval (UNEP Risoe, 2012).

The global carbon market was worth US\$176 billion in 2011, although the discrepancy between this headline market value and Clean Development Mechanism financial flows has continued to increase (Kossov and Guigon, 2012).⁵ In 2011, the primary trade in CDM offsets was worth US\$0.9 billion, its lowest level since the Kyoto Protocol entered into force in 2005 (see Figure 2).⁶

5 The headline figure calculates the Gross Nominal Value (GNV) of carbon derivatives, which account for approximately 85 per cent of all trades, at the price that they are expected to be worth on their maturity date and assuming the contracts are all fulfilled. This is likely to be an overestimate.

6 The primary market reflects the overall value of credits at the point of their initial sale. It may be that this figure is higher than the actual sales, though, because it includes ‘options’ for the sale of credits that may or may not materialise in future.

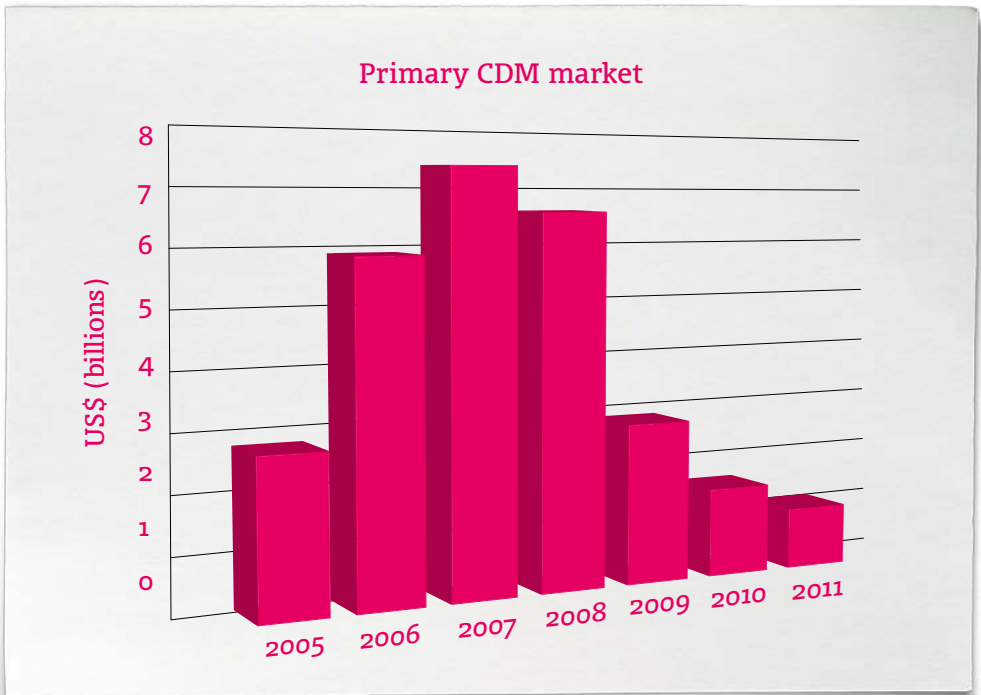


Figure 2. The rise and fall of the CDM. Value of primary market transactions, 2005-2011. Data source: World Bank.

In terms of geographical scope, over 75 per cent of registered CDM projects are in just four countries, with 48 per cent in China and 20 per cent in India. Measured by the number of credits issued, China is even more dominant, accounting for 64 per cent of the market (UNEP Risoe, 2012). By contrast, the 48 ‘least developed countries’ account for just 1 per cent of projects and 0.6 per cent of credits issued; while sub-Saharan Africa (excluding South Africa) hosts 1 per cent of projects and accounts for 1.5 per cent of credits issued (half of which went to projects in Nigeria).

The main explanation for these disparities is economic. The largest global investors direct their efforts to the most profitable projects. Economies of scale invariably point to the larger projects, and since offsets represent ‘avoided emissions’, these involve heavy industries or power sector projects in countries where grid energy already register significant greenhouse gas emissions. Such project opportunities rarely exist in sub-Saharan Africa and LDCs, which is not dirty enough or does not consume enough to compete successfully within the CDM. When exceptions exist, as in Nigeria, these generally relate to fossil fuel extraction.

Case study: Carbon credits for destructive gas flaring in Nigeria

There can be few clearer examples of the perverse incentives that the CDM puts in place than the 'gas utilisation' projects in the Niger Delta. These include Kwale, a site run by the Nigerian Agip Oil Company, which expects to receive around US\$180 million in offset credits by the end of 2016, and the Pan Ocean Gas Utilization Project, the largest registered CDM project in Africa, which anticipates over US\$300 million in credits by 2020. Shell and Chevron currently have similar projects under development.

The Niger Delta projects are based around claims to reduce gas flaring, an activity that has already been judged to be illegal by the Nigerian High Court. This means that carbon credits will reward companies for their failure to abide by the law. Furthermore, while the projects claim a reduction in gas flaring, closer analysis suggests that they mainly process liquefied natural gas (LNG) and other gases that were not associated with crude oil production in the first place (Osuoka, 2009: 92).

Such projects risk reinforcing fossil fuel dependency at both ends of the CDM pipe: the Nigerian Agip Oil company is co-owned by Eni, the Italian state oil company, which sells credits back to Eni refineries in Italy. The main buyer of carbon credits from the Pan Ocean project is Vattenfall, one of the largest operators of coal-fired power plants in Europe.

The impossibility of additionality

Offsetting counts claimed reductions in emissions in developing countries as part of the actual cuts promised by rich, industrialised countries – a method that rests on a flawed 'additionality' concept. A baseline assumption is made about what the future would have held without the project, the CDM is assumed to have altered that future, and credits are awarded as a result. Proving such claims is virtually impossible, with the CDM process encouraging technical experts 'to undertake a relentless search for far-fetched equivalences among the most distant activities' (Lohmann, 2009b: 181). In reality, such complex processes as methane reduction, forest carbon sequestration and counterfactual shifts in grid-connected energy production cannot be compared and the system is easily manipulated.

Projects are assessed using the CDM additionality tool, which requires them to pass either a 'barrier analysis' to identify factors that might otherwise prevent the project from taking place (such as a lack of in-country

experience with a particular technology, or uncertainty surrounding electricity tariffs), or an ‘investment analysis’ to show that the project is not financially viable without CDM revenue. This tool was introduced to improve the ‘objectivity’ of additionality testing, but it actually reaffirms the impossibility of adequately assessing project developers’ claims. It is generally possible to insinuate risks that regulations may change in future, while claims that projects deploy technologies that are not ‘common practice’ within a country have been shown to be highly malleable. Either way, as Haya points out, it is far easier to show that barriers exist than to prove that these are ‘likely to have prevented the projects from going forward without the CDM’, and the barrier analysis tests the former claim rather than the latter (Haya, 2010: 34).

There is no way to establish causality between ‘barriers’ and additionality, in other words, although there is considerable reason to believe that these are not factors determining investment decisions. To cite only the most obvious example, almost a third of hydroelectric dams applying for CDM credits were already completed at the time of registration and almost all hydro projects were already under construction while CDM credits were being applied for (Haya, 2007: 3).

Investment analysis is ‘considered to have the higher potential for being accurate’ (Haya, 2010: 33). The basic premise is that an accurate assessment can be made of the predicted costs and revenues accruing from a project, establishing a single ‘benchmark’ figure that represents the profit that investors can expect to receive in return for their project funding. In the case of a wind farm, for example, this would include outgoings from the costs of manufacture, land purchase, operation and maintenance, taxes, and the cost of servicing the interest on loans taken out against the building costs. If a project is not a financially attractive prospect for investors once these costs are set against the expected revenues from the sale of power, then it may be considered eligible for CDM credits to help it to overcome this hurdle. This is usually defined in terms of an anticipated ‘internal rate of return’ (IRR).

It is impossible to accurately determine a single ‘benchmark,’ however, since there is always a range of plausible counterfactual assumptions. As one leading textbook on corporate finance warns: ‘Do not trust anyone who claims to know what return investors expect’ (Brealey and Myers, 2003:160, citing Haya, 2010: 45).⁷ Project developers have flexibility in how they state a broad range of variables, including the cost of borrowing money (related both to the perceived creditworthiness of the company running the project and the ‘country risk’), the percentage

⁷ In practice, as Haya convincingly shows, few projects even achieve the stable assumptions set out in the ‘ideal’ case above.



In India a grouping of investors, verifiers, project developers and even the Chair of the national CDM authority conceded to US consulate officials that 'all Indian projects fail to meet the additionality in investment criteria and none should qualify for carbon credits'.

of money borrowed, the anticipated rate of depreciation in the value of the asset and its implication for tax rates, how long the plant will run for, how often it will be generating electricity at full capacity (the plant load factor), variability in renewables tariffs, and so on. Even in the 'best case' scenario, such as a wind project plant with contractually agreed build costs and a long-term power purchase agreement in place, there is a huge variability in potential investment returns. In fact, the range of legitimate assumptions that can be loaded into the investment analysis is always greater than the difference that carbon credits are likely to make to the investment decision. It is an open secret that these analyses are fundamentally manipulable, as carbon market participants will admit in unguarded moments. In India, for example, a grouping of investors, verifiers, project developers and even the Chair of the national CDM authority conceded to US consulate officials that 'all Indian projects fail to meet the additionality in investment criteria and none should qualify for carbon credits' (US Consulate Mumbai, 2008).

CDM reform: better governance, same problems

Once this memo was revealed by WikiLeaks, proponents of the CDM were quick to claim that improvements in 'governance' have already improved the mechanism's integrity, with further reforms still to follow on completion of a high-level Policy Dialogue.⁸

There are certainly plenty of governance failings that need addressing.⁹ Revolving doors between Designated National Authorities (local regulators in the host country), Designated Operational Entities (DOEs, auditing firms accredited by the Executive Board to assess whether projects meet the required standard to be registered) and project developers have led to conflicts of interest (Newell, 2012; Newell and Phillips, 2011). The 'oligarchy' of large DOEs that do most of the validation required to register projects, and verification required prior to credits being issued, has a poor record. The three main firms have all previously been suspended for cutting corners in their work, including failing to assign adequately trained staff, conduct independent reviews and engage in internal audits, and for verifying projects despite doubts whether they were 'additional' (Schapiro, 2010). The fact that these DOEs are paid by project participants themselves puts a downward pressure on standards.

Local 'stakeholder consultations' are often rudimentary, poorly advertised and inaccessible, and take place after the project is already under way or, in a number of reported cases, did not happen at all (CIEL and Earthjustice, 2011; Newell and Phillips, 2011). Local participants'

⁸ <http://www.cdmpolicydialogue.org/>

⁹ The following section draws on forthcoming mapping and assessment of CDM governance, conducted jointly with Payal Parekh.

comments are generally observational, with little evidence that they have affected how projects are implemented. There is not even any legal provision to withdraw projects if human rights abuses and local pollution impacts are proven, as in the notorious case of a palm oil plantation in Honduras, which was registered despite the reported murders of 23 local farmers who tried to recover land that they said was illegally sold to the project owners (Neslen, 2011).

The CDM Executive Board is subject to political conflicts of interest, with board members (who officially serve in a personal capacity) simultaneously working as climate negotiators and representatives of national DNAs (tasked with encouraging new CDM projects within countries or purchasing credits). Statistical analysis has shown that a project's chance of approval increases if there is a board member from the host country (Flues, Michaelowa and Michaelowa, 2008).

Some of these failings may be addressed by the Policy Dialogue, although it should not automatically be assumed that the result will improve the overall governance of the scheme. The current arrangements exist, in large part, because the regulators and negotiators who created and manage the CDM have a vested interest in encouraging ever more projects to pass through its pipeline. Project developers and other business lobbyists are now advocating reforms such as the 'fast-track' approval of certain project types that would lead to even fewer checks on the environmental integrity or social impacts of projects.

The focus on improving governance, moreover, does nothing to address the central problems with offsetting, as can be seen clearly if we return to the example of India's non-additional projects. Since 2008, when the WikiLeaks memo was written, the market fundamentals underpinning the CDM have deteriorated: carbon credit prices have collapsed, future price projections have been revised sharply downwards, and the experience of this downturn has encouraged investors to be more cautious – making it even less likely that CDM revenues determine investment decisions (Kossoy and Guigon, 2012). Any investors who backed a project today on the grounds that the CDM revenue was the key to its viability would quickly find themselves out of business.

Mobilising finance, perverse incentives and subsidies

The significance of this lack of additionality really comes to the fore when claims that the CDM 'transfers technology', or is a means to 'leverage' even larger sums from the private sector, are assessed. Once it is understood that the CDM is mostly subsidising existing plans, rather than driving new investment, it cannot accurately be said to drive 'technology transfer' either – although attempts to study the scheme's effects in this area identify an

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important exception. In 2008, the United Nations Framework Convention on Climate Change sought to measure the extent of CDM-related transfers by looking at how many companies reported 'the use of equipment or knowledge not previously available in the host country for the CDM project' (UNFCCC Registration and Issuance Unit, 2008). Industrial gas projects came out particularly well in this study. However, it has been clearly shown that, in the case of the destruction of HFC-23 (a potent greenhouse gas used as a refrigerant), a straightforward pre-existing technology was transferred in a massively inefficient manner, potentially generating €4.6 billion (US\$6.3 billion) in offset credits for installing filters in 17 industrial sites at a cost to the companies of less than €100 million (US\$138 million) (Wara, 2007). The overall result, moreover, was that the CDM created a perverse incentive to increase the production of HFC-23 in order to gain more offset credits (Schneider, 2011). More generally, the CDM has also been found to have 'provided incentives to retard the process of creating developing countries' policy in order to preserve credit eligibility' (Driesen and Popp, 2010).

Likewise, claims that the CDM has 'leveraged' large investments in clean technology fall at the hurdle of flawed and impossible additionality. A 2011 World Bank report to the G20 on 'Mobilizing Climate Finance' claimed that 'offset markets through the Clean Development Mechanism have resulted in US\$27 billion in flows to developing countries in the past 9 years, catalysing low carbon investments of US\$100 billion (World Bank, 2011: 6). In fact, the US\$27 billion figure is 'the value of transactions in the primary CDM market' between 2002 and 2010 – the estimated value that the credits will achieve when they are first sold (World Bank, 2011: 26). In the absence of additionality, this is not money 'mobilised' by the CDM but represents, rather, the scale of the potential subsidies that the CDM is offering to companies to do what, in all likelihood, most would have done anyway.

The impressive-sounding US\$100 billion figure is used to justify calls to 'scale up' carbon markets. Yet a closer look shows this to be misrepresented. The Bank goes on to explain that, as 'the bulk of transactions are forward purchase agreements with payment on delivery, actual financial flows through the CDM have actually been lower, about \$5.4 billion through 2010' (World Bank, 2011, 27).

Trading carbon

To further unravel these figures, it is worth looking a little more closely at how carbon is actually traded. The carbon market has both a 'primary' and a 'secondary' market. Primary refers to the first time that a permit or credit is sold. Most primary credits (pCERs), for example, are sold in advance of actually being issued. This is called 'forward selling,' and typically

involves the project developer signing an Emissions Reduction Purchase Agreement with a company, government or development bank. The first sale of the CERs can typically involve a contract that agrees a fixed price for a specified number of credits, which are expected to be delivered by a certain date. For the seller, the advantage is that up-front capital is made available, rather than the seller having to wait until after the project is up and running to gain the carbon revenues.

This type of arrangement has increasingly become a losing proposition for buyers, however. As carbon prices have declined, buyers are finding themselves locked into purchasing offsets at a rate way above their value in the current market. In response, many buyers are now seeking to renegotiate or dump these contracts by whatever means possible. This practice has been enabled by the fact that, outside of HFC or N₂O projects, most CDM projects have delivered fewer credits than initially specified, or have found that credit issuance is slower than initially expected – providing legal means for buyers to break contracts and find credits at a cheaper rate elsewhere, or renegotiate fixed-price into floating-price contracts (Kossoy and Guigon, 2012: 51).

Where this is not possible, the buyers have resorted to other means. The World Bank reports that Some large buyers also reportedly used their size and contractual position to impose ERPA renegotiations. Having hired the Designated Operational Entity (DOE) themselves, these buyers threatened to delay verification or cancel the DOE contract. Alternatively, by being the sole CDM focal point in certain projects, they renegotiated contracts based on the fact that the project's CERs would only be transferred upon their sole request, thus leaving sellers with no choice other than to accept new contractual terms (Kossoy and Guigon, 2012: 54).

New contracts are being negotiated with increasingly flexible terms, meanwhile. The majority of pCERs are now sold as 'options,' meaning that the buyer purchases the option to buy the credit at an agreed price at a later date. This transfers risk from the buyer to the seller, making it even less likely that any investor would take a chance on a CDM project if it were not merely subsidising existing activities (Kossoy and Guigon, 2012: 49).

At the same time, there have been significant changes in who is trading carbon since the start of the scheme. The CDM market was pioneered by the World Bank and government purchasers, with few private investors taking an interest until after Russia ratified the Kyoto Protocol in 2004, which brought that agreement into force (Alberola and Stephan, 2012: 9). The first private sector involvement came from boutique carbon specialists, such as EcoSecurities, which had advised governments on how



Reducing Emissions from Deforestation and Forest Degradation (REDD)

REDD+ puts a cash value on forests on the assumption that this will result in their preservation and, in turn, a carbon saving.¹ The scheme has been widely criticised, however, on the grounds that it would mainly benefit corporate investors but damage the livelihoods and threaten the cultures of indigenous peoples and other forest-dependent communities (Hall and Zacune, 2010). Alternative approaches to addressing deforestation emphasise improving forest governance, in particular by supporting the territorial rights of indigenous peoples and forest communities. These are sometimes cast as a replacement for REDD+, and in other cases as a radical reform of the current REDD+ framework (Boas, 2011; Rainforest Foundation, 2012).

The scope of the REDD+ proposals under the UNFCCC has already raised environmental concerns, since the proposals follow the Food and Agriculture Organisation's practice of defining forests so broadly as to include plantations (UNFCCC, 2010). There is also a risk that baselines for accounting 'avoided deforestation' could be set so high that payments will be triggered for increases in deforestation, as was the case with the flagship bilateral REDD agreement between Norway and Guyana (Lang, 2009).

Early experiences of REDD projects in Indonesia, meanwhile, have shown these to be concentrated on abandoned logging concessions and national parks, a long way from the deforestation frontier. In a context where the state claims ownership of the majority of forested land, treating the 50–70 million forest communities and indigenous peoples as 'illegal squatters', the implementation of these schemes is exacerbating land conflicts (Fried, 2012).

One of the most contentious debates on REDD+ relates to how it will be funded. The debate centres on whether public or private sources will be prevalent, and the extent to which it will generate carbon credits, and it is beset by lack of clarity. Although most REDD funding to date has been provided by the Norwegian sovereign wealth fund (the country's oil revenues), the jump-starting of a forest carbon market remains an important element in REDD+ 'readiness' activities (Horner,

1 REDD+ refers to proposals under the UNFCCC that go beyond REDD in making broader proposals for the 'Conservation of forest carbon stocks; Sustainable management of forest; [and] Enhancement of forest carbon stocks' (UNFCCC, 2011). REDD+ refers to UNFCCC-related proposals and REDD refers to national and bilateral schemes and pilots that are not necessarily linked to the multilateral climate negotiations.

2011). This is reflected in the design of pilot projects already under way. For example, the Institute for Global Environmental Strategies has created a REDD+ database with details of 25 projects (as of September 2011). Twenty-one of these consider the generation of carbon credits as integral to the project financing, three are considering selling offsets at a later date if a forest carbon market emerges, and only one had not yet considered offsetting (IGES, 2011).

In common with the CDM, the complex accounting procedures involved in commodifying forests tend to divert resources from forestry initiatives to carbon counting. Initial estimates and comparisons with the CDM would suggest that 30 per cent or less of the cost of a REDD credit would find its way to the project itself, while as little as 3 per cent may find its way to the producer (Carbon Retirement, 2009: 7; Munden Project, 2011: 8). The rest of the value would be absorbed by taxes, consultancy and brokerage fees and administration costs. Underpinning this structure is the likely emergence of 'monopsony power' – an imbalanced market with many sellers but few buyers – strengthening the hand of financial intermediaries, while ensuring that few benefits flow to the producers of 'REDD projects, the communities that live within them or the countries where they are located' (Munden Project, 2011: 11). In a significant, market-based critique of REDD proposals, the Munden Project also points out that forest carbon commodities are so poorly defined as to be 'unacceptably risky' as a basis for trading (2011: 4).

With carbon markets beset by a massive oversupply, REDD is not currently an attractive proposition for the majority of private carbon market investors, as a result of which bilateral and multilateral public funding is taking the lead in stimulating new investments and carbon accounting methodologies. Aside from the Norwegian contribution, which accounts for two-thirds of all money pledged to REDD-dedicated climate funds, the major donor countries are Australia, the United States and Germany. Australia and Germany have followed the Norwegian model in creating bilateral funds, while the largest multilateral funds – notably the Forest Investment Program – are coordinated by the World Bank (Caravani, Nakhoda and Schalatek, 2011). As the market develops, it is likely that public investments in this sphere will follow the broader trends in development and climate finance towards pooled public-private funds, shielding them from public scrutiny (Bracking, 2012).

The role of capital markets, meanwhile, is far from restricted to carbon trading – with some investors and conservation NGOs now proposing new financial instruments, notably forest bonds, that seek to diversify the source of revenues beyond carbon or ecosystem services credits (Cranford, Parker and Trivedi, 2011).

While such proposals may tackle some of the accounting uncertainties posed by offsetting, they do nothing to address the fundamental problems of the financialisation of tropical forests, such as the failure of REDD+ to address the real drivers of deforestation (for example, large-scale monoculture plantations, industrial-scale cattle ranching, mining and oil extraction) or the threat that REDD+ poses to the territorial rights and cultures of indigenous peoples and forest communities.

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to set up Designated National Authorities (DNAs) in the first place. Their main interest was in developing projects, in order to then resell the resulting credits to other financial speculators and to EU-based companies.

After the primary carbon market peaked in 2007, however, many of the initial speculators were over-exposed to projects that had not delivered credits, or holdings of credits whose value had declined as the financial crisis kicked in. This led to a wave of mergers and restructuring, which included investment banks taking a greater stake. For example, EcoSecurities (the largest project developer and one of the world's largest buyers of CERs) was taken over by JP Morgan in 2009; while the project developer OneCarbon was acquired by Orbeo, a joint venture between Société Générale and the chemical giant, Rhodia, in the same year (Alberola and Stephan, 2012: 9).

With these new investors came new carbon credit purchasing strategies, as Alberola and Stephan point out:

Since 2008, some investors have preferred to purchase carbon credit portfolios, containing a complete range of already purchased credits, rather than finance new CDM/JI projects, a process that can take up to three years until delivery (2012: 9).

These portfolios are arranged in a growing number of carbon funds – private, public and a mix of the two (Alberola and Stephan, 2012: 14). The private sector share of the carbon market continues to grow, however, alongside a shift in investment patterns. Governments seeking offsets to meet their Kyoto targets and companies looking for compliance with the ETS have mostly contracted sufficient credits for these purposes, while the majority of trades now relate to hedging or the pursuit of speculative gain (Alberola and Stephan, 2012: 15). A broader range of investment strategies has developed too, with a growth in direct equity stakes taken in the companies ('special purpose vehicles') that are often set up as the legal entity managing projects.

CER/EUA swaps are also becoming increasingly common. Under such deals, companies agree to a future exchange of EUAs (the ETS permits) and lower-priced secondary CERs (CDM credits). The assumption with such deals is that since these products are functionally the same for compliance with ETS targets, there is profit to be made from speculating on the difference between the traded prices of the two commodities (Eurex, 2008: 4).

In the EU market, trading has also become more concentrated in the hands of a small number of large financial firms and energy companies, which ‘rapidly expanded their market positions and influence’ in 2011, amidst a fire-sale of carbon assets as prices collapsed (Kossoy and Guigon, 2012: 34).



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The larger energy companies have developed their own trading divisions to hedge and speculate on EUAs and CERs. This reflects the broader financialisation of the energy sector, in which the leading companies derive an increasing proportion of their profits from financial speculation on the relative price of fossil fuel commodities (Kossoy and Guigon, 2012: 38). The introduction of carbon into this mix helps energy companies to hedge the risks these companies take when purchasing energy futures, although it does nothing to stimulate a shift towards renewables.

Such strategies are part of a broader trend towards more complex carbon market trading strategies. Whereas the theory of carbon trading presents a system of exchanges between two polluters to optimise the costs of meeting emissions reduction targets, in practice the majority of the market in operates in the following way. Speculators seek to profit from ‘arbitrage’ opportunities (analysing and betting on price differentials), as well as on the basis of statistical algorithms and models forecasting how carbon relates to the relative cost of coal and gas; oil, gas, coal, power and weather derivatives; currency trading; and meta-analyses of analysts’ own expectations (Kossoy and Guigon, 2012: 34; Karmali, 2008, 4). Most of what is traded is permits and credits, or the option to buy these at a specified point in the future, which does not yet exist (Kossoy and Guigon, 2012: 34).¹⁰

The development of ever more complex trading and speculative strategies is the true ‘governance’ challenge posed by the carbon market, which concentrates power in the hands of a few large financial and energy corporations. It is consistent with the broader ‘giant bow-tie structure’ of interwoven financialised interests, where most capital flows through a tightly-knit core of institutions that straddle the financial sector as well as companies operating in the ‘real economy,’ such as power producers, which also make investment decisions based on complex hedging strategies and speculative gaming (Vitali, Glattfelder, and Battiston, 2011).

The carbon market produces knowledge (and ignorance) that reinforces this financialised power structure (Lohmann, 2008). By abstracting ‘carbon’ as a tradable commodity, it frames climate change as a problem

¹⁰ Eighty-eight per cent of EUAs are transacted as futures, of which 10 per cent (and rising) are options trades.

of cost adjustments that can be managed by a market that is assumed to allocate goods efficiently, rather than as a historically embedded problem of the dominant fossil fuel-based development model. As this market has grown, it has established a whole new infrastructure and market for financial derivatives products based on validating, verifying, accounting, risk-assessment, future-modelling and commodity hedging that shifts the frame of decision-making about whether and where emissions reductions take place into the hands of analysts whose interests are profit maximisation, not environmental protection or social well-being.

Community Disempowerment Mechanism or Commodity Development Machine?



The reframing of climate change as a financial market problem is also profoundly disempowering for the communities most affected by the extremes of weather, flood risks and poor harvests that it causes, although not for the reason (as is sometimes suggested) that they lack access to carbon markets.

The reframing of climate change as a financial market problem is also profoundly disempowering for the communities most affected by the extremes of weather, flood risks and poor harvests that it causes, although not for the reason (as is sometimes suggested) that they lack access to carbon markets. No matter of ‘capacity building’ is going to redress the power imbalance that is introduced once addressing climate change is reduced to a question of financial flows that pass through capital markets.

The developing carbon market infrastructure, moreover, renders policy-makers increasingly deaf to the demands of communities, except insofar as resistance is registered as ‘disruptive’ to market development. At the same time, social and environmental values are reduced to financial statements of the ‘social cost of carbon’ or ‘natural capital accounting’. Yet this reduction of value to price can serve to undermine the case for addressing climate change, as George Monbiot points out:

Subject the natural world to cost-benefit analysis and accountants and statisticians will decide which parts of it we can do without. All that now needs to be done to demonstrate that an ecosystem can be junked is to show that the money to be made from trashing it exceeds the money to be made from preserving it (Monbiot, 2010).

Although pricing is not the same as commodifying, in a neoliberal ideological and institutional context, the one has tended to lead to the other, with carbon the first of several ‘ecological commodities’ under construction. The markets that emerge within this framework are set up to rationalise continued environmental destruction. As shown above, the oversupply of carbon permits and credits has provided industrial subsidies for polluters, and has failed to incentivise cleaner investments. However, the developing ‘value’ of this market lies in the production of new possibilities for commodity hedging and speculative portfolio investments – which are, in turn, held mainly by the financial and power companies that are at the same time the main investors in fossil fuels and the industries

reliant upon them. Since those conventional, fossil fuel-based investments far exceed the scale of carbon and other environmental ‘niche’ markets, they also tend to subordinate investment decisions made in them. That ultimately affects not only private sector finance, but also the public ‘climate finance’ which, as we have seen, is increasingly passing through ‘mixed’ funds structured in which public money is deployed in accordance with private capital market investment strategies.

One final governance challenge relates to how carbon market growth is reported, in particular when this is related to claims that the market ‘mobilises’ finance for cleaner development. The World Bank’s State and Trends of the Carbon Markets report, the leading source of global market data, has routinely maximised the perception of a healthy market in contrast to the details of how this has been achieved. In 2010, it trumpeted carbon market growth in the EU, despite the fact that a significant proportion of this increase was the result of fraudulent trading. In 2012, the majority of the carbon market growth reported by the Bank had to do with changes in how it reports the figures – which now captures a greater proportion of future options trades, even though the authors admit that ‘a substantial proportion’ of these will not be exercised (Kossoy and Guigon, 2012: 49). The majority of trading, as these reports make clear, is not to comply with Kyoto or ETS requirements but relates to ‘hedging, portfolio adjustments, profit taking, and arbitrage’ (Kossoy and Guigon, 2012: 18).

Can carbon trading be fixed?

One of the most common responses to the clear evidence that carbon trading is not working is to suggest fixes that would ‘improve’ the workings of the system: changing rules on the ‘banking’ of permits; introducing price floors and ceilings to control volatility; expanding global carbon markets to ‘increase liquidity’; and so on.

What these proposals have in common is an implicit assumption that carbon trading fails because the rules have been designed inadequately or have been badly applied. Although instances of such failings certainly exist, they bring us no closer to understanding why the system has misfired so spectacularly. They don’t, for example, answer the question of why so many corporations and states pushed for the inclusion of large volumes of offsets in carbon markets, or address actual carbon market investment strategies.

Many carbon market reform proposals, meanwhile, actually advocate expansion of carbon markets and the relaxation of checks on environmental integrity. For example, proposed changes such as ‘sectoral crediting’, the inclusion of new sectors in the Clean Development Mechanism, and the generation of carbon credits associated with Nationally Appropriate

Mitigation Actions, would primarily serve to increase the volume of carbon trading.¹¹ Such proposals are not being driven by considerations of environmental integrity, but by financial interests. The drive to expand carbon markets is being accompanied by the development of more complex carbon products, deploying a variety of derivative and hedge fund techniques.

Looked at more holistically, it is clear that the carbon market will continue to be prone to ‘over-allocation’, distributions of allowances and rules on crediting that act as subsidies for polluters. The supply of carbon is ‘uniquely at the mercy of the political pen – where it was conceived’, since the act of allocating permits (or determining quantities available for auctioning) is the result of a political decision, rather than something that is indexed to a real-world product (Gallagher, 2009: 2). The political determinants on supply make the EU carbon market particularly prone to lobbying influence – either through direct lobbying by Brussels-based associations, or by lobbying national governments to act on behalf of certain industries in EU processes. Such lobbying affects not simply the rules governing how the market operates, but the supply of permits and credits. In the case of international offsets, governments are both suppliers and users of credits, contributing to significant conflicts of interest (Lohmann, 2011). The combination of these factors with the difficulty of identifying clear price drivers for carbon markets (because the underlying asset is fundamentally unstable) makes for arbitrary volatility, while the subordination of carbon to fossil fuel hedging and investment priorities sets their alleged environmental purpose on its head (Gallagher, 2009, 2; Lohmann, 2009a: 28–30). The concentration of power in the hands of a handful of financial and corporate actors, and the transformation of the decision-making framework that carbon trading enables, are the true ‘governance’ challenge that carbon trading poses.

In seeking ways forward, we need to look beyond carbon trading and look again at the nature of the problem being addressed. Tackling climate change requires, first and foremost, a rapid phasing out of fossil fuel use. No single alternative will suffice to achieve this. There is no evidence that a complex social and economic problem of this scale can be effectively tackled by indirect economic ‘incentives’ of the sort offered by carbon trading, still less by an investment structure that concentrates power in the hands of a few large financial actors whose main interest lies in the continued extraction and trade in fossil fuels.

A planned transition away from fossil fuels, and the unsustainable industrial and agricultural practices that they enable, requires a broad range of approaches that shift money in different directions, while also limiting

¹¹ For more on sectoral carbon markets, see Reyes (2011).

the role of finance as the principal determinant of decision-making. In the EU this would include measures to shift subsidies away from fossil fuel production; a reassessment of energy demand and efficiency, including demand-side management measures; and the expansion of various forms of conventional regulation, including the adoption of non-tradable output limits on greenhouse gas emissions.

These goals cannot be achieved without public investment, since the research and development costs associated with large-scale transformative technologies tend to require a greater investment risk than private capital is willing to bear. However, 'public investment' itself is not a sufficient remedy, especially within the current institutional framework, where public ownership generally takes the form of preferred-bid contracting with private entities, and control remains unaccountable and within private hands.

More broadly, the nature of existing public institutions needs to be re-examined, particularly in the energy sector, where within the EU privatisation has led to a consolidation, with control now in the hands of a small number of private and public companies – such as EDF, owned by the French state, and Vattenfall, owned by the Swedish government. These state companies are structured as commercial enterprises, whose value is increasingly provided by financial speculation, affording little scope for public influence in favour of a sustainable and just energy production model. For such reasons, any increase in public finances to change the energy system should be accompanied by democratising the governance of the expenditure.

On a global scale, meanwhile, EU countries and corporations – which have done most to contribute to accelerating climate change – have huge responsibilities for the restitution and repayment of a 'climate debt'. This implies not merely a commitment to public finance for community-controlled projects in the global South, but adjustments in trade rules to favour the patent-free exchange of intellectual property rights to low carbon technologies; and a more robust framework of international corporate law to tackle the impunity of large corporations in respect of human rights abuses and environmental degradation. In the case of forests and land use, for example, a just and sustainable approach would start with recognition of the existing land tenure systems of Indigenous Peoples and forest-dependent communities, and the promotion of sustainable local farming and people's food sovereignty over and above the interests of industrialised agriculture.

Ultimately, however, there are no short cuts that bypass the difficult work of political organising and institutional change, and no policy or market fixes that obviate the need for moving beyond fossil fuels.

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Darken the sky and whiten the earth – The dangers of geoengineering

ETC Group – Pat Mooney, Kathy Jo Wetter and Diana Bronson



Geoengineering is the intentional, large-scale intervention in the Earth's oceans, soils and atmosphere, most often discussed in the context of combating climate change.

The 'proof of principle' that cumulative, local interventions in ecosystems can bring about planetary-level effects is beyond dispute. That's why we have human-induced climate change. However, as we approach so-called 'climate tipping-points', another notion is quickly gaining ground: that we can use geoengineering as an emergency measure to intervene purposefully and to correct the inadvertent but serious harm we've done.

Geoengineering is the intentional, large-scale intervention in the Earth's oceans, soils and atmosphere, most often discussed in the context of combating climate change. It can refer to a wide range of schemes, including: blasting sulphate particles into the stratosphere to reflect the sun's rays (referred to as 'solar radiation management'); dumping iron particles in the oceans to nurture CO₂-absorbing plankton; firing silver iodide into clouds to produce rain; genetically engineering crops so their leaves might reflect more sunlight.

Harvard physicist and geoengineering advocate, David Keith, describes geoengineering in the context of climate change as 'a countervailing measure, one that uses additional technology to counteract unwanted side effects without eliminating their root cause, "a technical fix"' (Keith, 2010a: 494). In other words, geoengineering uses new technologies to try to rectify the problems created by the use of old technologies.

Amidst growing public unease and increasing concentrations of greenhouse gases in the atmosphere, Organisation for Economic Co-operation and Development (OECD) countries, in particular, are feeling the pressure to 'bite the bullet'. They either adopt socially responsible policies to dramatically cut fossil fuel consumption, or they can hope for a more palatable alternative – a 'silver bullet' in the form of technological solutions that may help preserve the status quo without the harmful side effects. This silver bullet option is most strikingly embodied in the notion of geoengineering, and it's gaining favour. Not surprisingly, it is the states in the

global North, which are responsible for most of the historic greenhouse gas emissions and have either denied climate change or prevaricated for decades, that seem to be warming most quickly to the geoengineering option. And they would have de facto control over its deployment.

Only the world's richest countries can really muster the hardware and software necessary to attempt rearranging the climate and resetting the Earth's thermostat. Moreover, once the smog clears, the major private sector players in geoengineering will likely be the same energy, chemical, forestry and agribusiness companies that bear a large responsibility for creating our current climate predicament – in effect, the 'old guard geoengineers' that profited from climate changing industries of the twentieth century.

Opting for geoengineering flies in the face of precaution, and history. Even some of those who would like to see large-scale investment in the field are quick to acknowledge that we do not know enough about the Earth's systems to risk intentional geoengineering; we do not know if geoengineering is going to be inexpensive (as proponents insist) – especially if/when geoengineering doesn't work as intended, forestalls constructive alternatives, or causes adverse effects; we do not know how to recall a planetary-scale technology once it has been released. Techniques that alter the composition of the stratosphere or the chemistry of the oceans are likely to have unintended consequences as well as unequal impacts on both ecosystems and societies around the world (Royal Society, 2009: 52).

The governments most open to putting geoengineering options 'on the table' – the United States and United Kingdom in particular, but also several other Annex 1 countries – are the ones that have failed to pony up even minimal funds for mitigation or adaptation action on climate change. Indeed in some quarters the MAG approach (Mitigation, Adaptation and Geoengineering) is already being proposed for discussions on climate change (Institution of Mechanical Engineers, 2009). In practice, this means governments may divert climate change funding from climate change mitigation and adaptation toward geoengineering.

Given the dismal and contested decades of climate negotiations, there is little reason for the governments or peoples of most of Africa, Asia and Latin America to trust that the governments, industries or scientists of the biggest carbon-emitting states will protect their interests. In the absence of demonstrable goodwill by the states likely to conduct geoengineering, the governments of the global South should be suspicious. In the absence of public debate and without addressing the inequalities between rich countries and poor countries – in terms of both historical responsibility for climate change and the potential impacts of any technologies deployed to address it – geoengineering deployment would be an act of 'geopiracy'.

What is geoengineering?

Geoengineering refers to new and diverse technologies that are already being routinely classified as solar radiation management (SRM), carbon dioxide removal and sequestration, or weather modification.

Solar radiation management (SRM)

Solar radiation management technologies aim to counter the effects of greenhouse gases by increasing the radiation of sunlight back into space. SRM encompasses a variety of techniques, including: using reflective ‘pollution’ to modify the atmosphere, blocking incoming sunlight with ‘space shades’ and covering deserts with reflective plastic. None of these technologies lowers levels of greenhouse gases in the atmosphere; the intention is only to counter some of the side effects of high levels of greenhouse gases in the atmosphere.

Solar radiation management (SRM) technologies aim to counter some of the effects of greenhouse gases by increasing the radiation of sunlight back into space.



SRM (blocking or reflecting sunlight) could cause significant environmental harm, including releasing additional greenhouse gases into the atmosphere, changing weather patterns and reducing rainfall, damaging the ozone layer, diminishing biodiversity, reducing the effectiveness of solar cells as well as causing sudden and dramatic climatic changes if deployment is stopped, either intentionally or unintentionally. (See Case Study 2 below for more information.) SRM will not address the problem of atmospheric greenhouse gases or ocean acidification. Political uncertainties are implied by the technical uncertainties, but are even more daunting: Who should control the Earth’s thermostat? Who will make the decision to deploy? What are the implications of one country, corporation, or even a billionaire deciding unilaterally – or as part of a ‘coalition of the willing’ – to pursue deployment?

Geoengineering involving SRM technologies

Artificial volcanoes: Continuously spraying particles (e.g., sulphur, titanium dioxide) into the stratosphere to increase reflection of incoming solar radiation; particles could be injected into the stratosphere by, for example, aeroplanes, artillery, hoses lifted by giant balloons.

Desert covering: Covering large expanses of desert with reflective materials.

Space sunshades: One suggestion describes launching trillions of small, free-flying spacecraft a million miles above the Earth to form a cylindrical ‘cloud’ 60,000 miles long to divert about 10% of sunlight away from the planet.

Arctic ice covering : Covering snowpack or glaciers in the Arctic with insulating material or a nanoscale film to reflect sunlight and prevent melting.

White roofs and pavements or mountaintop painting: Painting roofs and road surfaces white to reflect sunlight (low-tech geoengineering).

‘Climate-ready’ crops: Includes genetic engineering to increase albedo (reflectivity) as well as plans to engineer crops and trees to be drought, heat or saline resistant.

Space mirrors: Putting a superfine reflective mesh of aluminium between the Earth and sun.

Large scale land-use change/rainwater harvesting: Engineering large-scale changes in water movements in order to provoke cloud formation to reflect sunlight.

Carbon dioxide removal and sequestration

Carbon dioxide removal and sequestration are geoengineering technologies intended to take carbon dioxide out of the atmosphere after it has been released. Some of the technologies use mechanical devices; others modify the chemical balance in the oceans to stimulate increased uptake of CO₂, while other technologies manipulate species and ecosystems with the intent of creating ‘carbon sinks’.

The duration and the safety of sequestration in land or sea (whether through biological or mechanical means) are mostly unknown; and many of these techniques require land- and/or ocean-use changes that will negatively affect poor and marginalised people. Sequestration technologies intended to manipulate organisms or ecosystems are likely to have unpredictable side effects. For the most part, these technologies are also energy-intensive. To date, there is no way to ensure safe and affordable long-term carbon sequestration.

Geoengineering technologies involving CO₂ removal and sequestration

Ocean fertilisation with iron or nitrogen: Adding nutrients to ocean water to stimulate the growth of phytoplankton in an attempt to promote carbon sequestration in deep sea

Biochar: Burning biomass through pyrolysis (i.e., low oxygen environments so carbon is not released) and burying the concentrated carbon in soil

Carbon-sucking machines or air capture and mineral sequestration or synthetic trees: Extracting CO₂ from the air by using liquid sodium hydroxide, which is converted to sodium carbonate, then extracting the carbon dioxide in solid form to be buried

Modifying ocean upwelling or downwelling: Using pipes to bring up nutrient-rich seawater to the surface to cool surface waters and enhance ocean sequestration of CO₂

'Enhanced weathering' / adding carbonate to the ocean: Increasing ocean alkalinity in order to increase carbon uptake

'Enhanced weathering' (terrestrial): Controlling levels of atmospheric CO₂ by spreading fine-powdered olivine (magnesium iron silicate) on farmland or forestland

Crop Residue Ocean Permanent Sequestration (CROPS): Storing carbon by dumping tree logs or other biomass into seawater

Genetically engineered algae and marine microbes: Engineering communities of synthetic microorganisms to sequester higher levels of carbon dioxide (in ocean communities or in closed ponds, or even to cover buildings)

Weather modification

The idea that humans can intentionally control the weather has a long history reaching back to indigenous rain dances and the lighting of fires. Since the 1830s, governments and private companies have attempted to apply technological know-how to increase or decrease precipitation or to restrain storms by altering landforms, burning forests and dropping chemicals into clouds – both for military and non-military purposes. As climate change brings more frequent extreme weather events ranging from drought to tropical storms, weather control is making a comeback. Weather modification is a classic 'end-of-pipe' geoengineering response that neither addresses the causes nor the mechanism of climate change,



So-called 'weather warfare' by the US government during the Vietnam War led to an international agreement to ban hostile uses of weather modification techniques.

but seeks only to alter its effects. Weather modification has also been advanced as an adaptation technology for climate change (for example, for protecting water flow for hydropower schemes).

Predicting the weather is difficult; proving the efficacy of weather interventions is even more difficult. Nonetheless, attempts to produce rain in one place have been regarded by neighbouring cities as rainfall 'theft', especially if crops fail in the aftermath of the weather intervention. If interventions such as altering the course of hurricanes become possible, extensive damage at another site may no longer be considered 'an act of God'. So-called 'weather warfare' by the US government during the Vietnam War (under the code name 'Operation Popeye') led to an international agreement to ban hostile uses of weather modification techniques (ENMOD treaty, see below). Since weather is complex and inherently transboundary, the line between what is a hostile or peaceful intervention may be difficult to determine.

Geoengineering technologies involving weather modification

Cloud seeding to increase precipitation: Spraying chemicals (usually silver iodide) into clouds to precipitate rain or snow – already practiced on a large scale in the United States and China, despite scepticism about effectiveness

Storm modification (e.g., redirecting or suppressing hurricanes): Attempting to prevent the formation of storms or affect their pathways

Defining geoengineering

Defining geoengineering is a political act. As new technological climate fixes are contemplated, definitions become more complex, contentious and consequential. For example, whether or not to include carbon capture and storage, biochar, or weather modification under the rubric of geoengineering is hotly disputed. At the same time, as governments and multilateral organisations begin to articulate positions on technological developments, they require more precise definitions. Anyone who has participated in international negotiations knows the long and tedious hours spent wrangling over definitions that can have far-reaching consequences when they are incorporated into international law or multilateral agreements.

ETC Group defines geoengineering as the intentional, large-scale technological manipulation of the Earth's systems, including systems related to climate.

Most definitions of geoengineering include a reference to intent (i.e., to combat climate change). But the laudable goal of combating climate change has no place in the definition of geoengineering, as it suggests that geoengineering technologies do, in fact, combat climate change. The consequence is giving the suite of planet-altering technologies a veneer of respectability and efficacy it has not earned.

There is also a move, particularly by scientists actively involved in geoengineering research, to get away from the term *geoengineering* altogether. They argue that the term is too vague or that other descriptors are better from the point of view of public relations. The scientists who gathered in Asilomar, California, in March 2010 to look at 'voluntary guidelines' for research, for example, not only studiously avoided the term geoengineering (the conference was on 'climate intervention'), but they also sought to rebrand 'solar radiation management' as 'climate intervention' and carbon dioxide removal as 'carbon remediation'. Furthermore, the statement by the Scientific Organizing Committee at the conclusion of the controversial meeting did not mention geoengineering (nor for that matter, the voluntary standards the meeting was convened to develop) (Climate Institute, 2010).

Different multilateral bodies may end up defining geoengineering differently. However, there is general agreement that the following elements be included in a definition of geoengineering:

Intent: Geoengineering is always deliberate (even if it may have unintended impacts). Unintentional harm to the global environment or climate from other activities (i.e., global warming) is thus excluded.

Scale: Geoengineering technologies are intended for global, or at least large-scale, deployment rather than local application.

Technology: Geoengineering is a high-technology approach: changing consumption patterns or adopting agroecological practices, for example, do not qualify, although either could have a noticeable impact on the climate.

Earth systems: Contemporary discussions about geoengineering almost always invoke the climate crisis (that is the main rationale for their deployment – 'desperate times call for desperate measures') but it is

conceivable that geoengineering schemes could be employed to manage the Earth's hydrological cycle or nitrogen cycles in addition to the carbon cycle. While it may be useful to refer to the climate for descriptive purposes, it would be short sighted to think that climate change mitigation will be the sole purpose of these technologies, especially given the 'market opportunities' geoengineering may offer.

Beyond all these definitional elements, geoengineering is also a philosophy and a worldview coloured by a Western, male-dominated, technological paradigm. As Simon Terry of the Sustainability Council of New Zealand has pointed out, geoengineering contrasts sharply with the notion of stewardship: geoengineers see ecosystems as resources to be optimised or 'fixed' rather than systems to be protected and restored (Terry 2009). The *Encyclopaedia Britannica* defines engineering as 'the application of science to the optimum conversion of the resources of nature to the uses of humankind'; 'geo', of course, refers to the Earth. As Indian ecologist Vandana Shiva articulated recently: 'It's an engineering paradigm that created the fossil fuel age that gave us climate change... Geoengineering is trying to solve the problems in the same old mind-set of controlling nature' (*Democracy Now*, 2010).

How we got here: the mainstreaming of geoengineering



The US President's Science Advisory Committee suggested already in 1965 that reflective particles could be dispersed on tropical seas (at an annual cost of around US\$500 million), which might also inhibit hurricane formation.

In a sense, geoengineering has always been 'on the table' as a possible response to climate change. As early as 1965, the US President's Science Advisory Committee warned in a report, *Restoring the Quality of Our Environment*, that CO₂ emissions were modifying the Earth's heat balance (Fleming, 2007: 13). That report, regarded as the first high-level acknowledgment of climate change, went on to recommend – not emissions reductions, but a suite of geoengineering options. The authors of the report asserted, 'The possibilities of deliberately bringing about countervailing climatic changes...need to be thoroughly explored' (Fleming 2007: 13). They suggested that reflective particles could be dispersed on tropical seas (at an annual cost of around US\$500 million), which might also inhibit hurricane formation. The Committee also speculated about using clouds to counteract warming. As James Fleming, the leading historian of weather modification and geoengineering, wryly notes, the very first official report on ways to address climate change 'failed to mention the most obvious option: reducing fossil fuel use' (Fleming, 2007: 57).

The notion of engineering the Earth's climate really took off in 2002 when Paul J. Crutzen – who won a Nobel Prize for pioneering work on the ozone layer and is a professor at the Max-Planck-Institute for

Chemistry in Mainz, Germany – offered grudging support for geoengineering in the journal *Nature*. Since we are living in the ‘anthropocene’ era in which humans are increasingly affecting the climate, Crutzen suggested, our future ‘may well involve internationally accepted, large-scale geoengineering projects’ (Crutzen 2002). The same year, *Science* published its own article arguing for geoengineering as a legitimate approach to combat climate change (Hoffert et al., 2007).



Crutzen willingly acknowledged that his was a risky proposition and insisted that it should be undertaken only if all else failed. He went on to add that the political will to do anything else seemed to have failed already.

By 2005, 40 years after the release of the Science Advisory Committee’s report, everybody, including the sitting US president, was talking about global warming: scientists warned that the temperature rise on the Arctic ice cap and Siberian permafrost could ‘tip’ the planet into an environmental tailspin, and the US Congress agreed to study a bill that would establish a national ‘Weather Modification Operations and Research Board.’ The same year, another high-profile climatologist, Yuri Izrael, former vice-chair of the Intergovernmental Panel on Climate Change (IPCC) and head of the Moscow-based Institute of Global Climate and Ecology Studies, wrote to Russian president, Vladimir Putin, outlining a proposal to release 600,000 tonnes of sulphur aerosol into the atmosphere to take a few degrees off global temperatures.

Paul Crutzen returned to the debate in August 2006 when he wrote an ‘editorial essay’ in the journal *Climatic Change* calling for active research into the use of ‘sub-micrometer’-sized sulphate-based aerosols to reflect sunlight in the stratosphere (Crutzen, 2006). Crutzen opined that high-altitude balloons and artillery cannons could be used to blast sulphur dioxide into the stratosphere, in effect, simulating a volcanic eruption.

The sulphur dioxide would convert to sulphate particles. The cost could run between US\$25 billion and US\$50 billion per year – a figure, he argued, that was well below the trillion dollars spent annually by the world’s governments on defence. Crutzen noted that his cost estimates did not include the human cost of premature deaths from particulate pollution. Such tiny reflective particles could be resident in the air for two years. Crutzen willingly acknowledged that his was a risky proposition and insisted that it should be undertaken only if all else failed. He went on to add that the political will to do anything else seemed to have failed already.

An editorial in the same issue of *Climatic Change* by Ralph J. Cicerone, an atmospheric chemist and president of the US National Academies, also supported further research on Crutzen’s geoengineering proposals (Cicerone 2006). The same year he told *The New York Times*, ‘We should

treat these ideas like any other research and get into the mind-set of taking them seriously' (Broad 2006).

By November 2006, NASA's Ames Research Center had convened an elite meeting of geoengineering advocates to explore options with Lowell Wood, who was then at the Lawrence Livermore National Laboratory, presiding. 'Mitigation is not happening and is not going to happen', the physicist reportedly told the group (Fleming, 2007). The time has come, he argued, for 'an intelligent elimination of undesired heat from the biosphere by technical ways and means' (Fleming 2007). According to Wood, his engineering approach would provide 'instant climatic gratification' (Fleming 2007). From that meeting came the beginnings of a campaign to secure funding for geoengineering research – requiring the field to gain respectability – and fast. Just three years later, geoengineering got a huge legitimacy boost from the UK's Royal Society when it published *Geoengineering the Climate: Science, governance and uncertainty*, which recommended that public funding be dedicated to geoengineering research (Royal Society, 2009).

The failure to reach a meaningful multilateral consensus on emissions reduction at the UNFCCC's COP-15 in Copenhagen (2009) – despite the largest mobilisation for climate justice in history – offered geoengineers a more popular public platform. As delegates were just beginning to check out of their hotels, Nathan Myhrvold gave a 30-minute interview on CNN, extolling the virtues of putting sulphate particles into the stratosphere as a solution to global warming; he explained how a 25-km hose held up by balloons could deliver the particles to the right place to reflect sunlight away from the Earth (GPS Podcast, 2009).

Myhrvold is a former Chief Technology Officer at Microsoft and now runs Intellectual Ventures Management, LLC, which holds patents on geoengineering technologies. Prominent geoengineering scientists Ken Caldeira and John Latham are listed among the firm's senior inventors, whom Intellectual Ventures supports with funding and business expertise. The firm files 500–600 patent applications every year. (Ken Caldeira and Harvard's David Keith jointly manage the 'Fund for Innovative Climate and Energy Research' bankrolled by Bill Gates. Since 2007 the Fund has given out US\$4.6 million in research grants.)

The Lomborg Manoeuvre: Once climate-change denier, now geoengineering devotee

An odd effect of geoengineering's mainstreaming has been an alignment of positions that were previously diametrically opposed. While some long-time climate scientists such as Paul Crutzen and Ken Caldeira claim to have only gradually and reluctantly embraced geoengineering out of a fear of global warming's devastating effects, a new and powerful lobby for geoengineering has emerged in recent years, made up of people whose motivation has never been concern for the environment or for the world's poorest people.

The 'Lomborg manoeuvre' – switching from opposing action on climate change to supporting the most extreme action on climate change – is now seemingly de rigueur among industrial apologists, former climate change sceptics and 'deniers'.



Emil Jupin

Bjørn Lomborg is best known as the self-styled and controversial 'sceptical environmentalist' who has consistently downplayed the seriousness of climate change.

In June 2008, Newt Gingrich, former Speaker of the House in the US Congress, sent a letter to hundreds of thousands of Americans urging them to oppose proposed legislation to address global warming. Gingrich argued for geoengineering the atmosphere with sulphates as a better option to fight climate change. 'Geoengineering holds forth the promise of addressing global warming concerns for just a few billion dollars a year', wrote Gingrich (Gingrich, 2008). 'Instead of penalizing ordinary Americans, we would have an option to address global warming by rewarding scientific innovation... Bring on the American Ingenuity. Stop the green pig' (Gingrich, 2008).

Gingrich is a recent presidential hopeful and senior fellow at the American Enterprise Institute (AEI) – a neoconservative think tank promoting free enterprise and limited government – closely associated with the recent Bush administration. AEI's own geoengineering project was led by Lee Lane, an advisor to the Bush administration, now at the Hudson Institute, another neoconservative think tank. In 2009, Lane and co-author J. Eric Bickel published 'An Analysis of Climate Engineering as a Response to Climate Change', a report advocating the addition of geoengineering to existing responses to climate change on the basis of a cost-benefit analysis. Lane and Bickel claimed spraying seawater into clouds might be able to fix climate change and thereby add us\$20 trillion to the global economy.

The report was published and widely broadcast by Bjørn Lomborg's Copenhagen Consensus Center (CCC). Lomborg is best known as the self-styled and controversial 'sceptical environmentalist' who has consistently downplayed the seriousness of climate change. Lomborg is now using his CCC and high media profile to push for geoengineering not as 'Plan B', but as 'Plan A' – the preferred route to cooling the planet. In May 2012, the CCC published a new paper by Lane and Bickel, *Climate Change: Climate Engineering Research*, in which they 'roughly estimate' that the benefit-to-cost ratio of research and development of SRM technologies is 'on the order of 1000 to 1' (Bickel and Lane, 2012: 3).

The ‘Lomborg manoeuvre’ – switching from opposing action on climate change to supporting the most extreme action on climate change – is now seemingly de rigueur among industrial apologists, former climate change sceptics and ‘deniers’, especially in the United States. Besides Lane at the Hudson Institute and Gingrich at AEI, political operators at the Cato Institute, the Thomas Jefferson Institute, the Hoover Institution, the Competitive Enterprise Institute, the International Policy Network and elsewhere have professed their faith in the geoengineering gospel. Geoengineering has been a mainstay of discussion for several years now at the Heartland Institute’s International Conference on Climate Change, dubbed the annual ‘climate deniers jamboree’. The *New York Times* recently described the Heartland Institute ‘as the primary American organization pushing climate change skepticism’ (Gillis, 2012).

For those who previously doubted (or still do doubt) the science of anthropogenic global warming, the geoengineering approach shifts the discussion from reducing emissions to end-of-pipe ‘solutions’. Once geoengineering is an option, there is less need to bicker about who put the carbon dioxide in the atmosphere (and less need to ask them to stop). If we have the means to suck up greenhouse gases or turn down the thermostat, emitters can, in principle, continue unabated.

Geoengineering, governance and multilateral fora

As geoengineering gains prominence and respectability in some scientific and policy discussions emanating from the North, the issue of governance has come to the fore. For geoengineering advocates, this is both welcome and worrisome. On the one hand, they fear restrictive or limiting policy decisions; on the other hand, they recognise that the existence of some kind of governance framework will facilitate development; their goal, then, is to influence the shape of the frameworks to best serve their needs. The dominant frame in which experts talk about geoengineering governance is voluntary: ‘codes of conduct’, ‘standards’, ‘guidelines’ and ‘bottom-up approaches’ are offered; ‘legally binding’ is generally taboo.

The years since the 2009 climate negotiations in Copenhagen have been critical for the discussion of geoengineering, in general, and of governance in particular. The collapse of the Copenhagen negotiations offered advocates of geoengineering a political opportunity to advance their agenda. Building on the credibility boost obtained by the UK Royal Society’s 2009 report, they undertook to debate the question of governance publicly.

Governance determines who has power, who makes decisions, how other players make their voices heard, and how account is rendered.

Often, it is the scientists and institutions engaged in the geoengineering projects that are among the most anxious to put in place some structure of governance, since the absence of any governance regime means delayed funding, missed experimentation opportunities, a wary public and the inability to bring techno-fixes to market.

A meaningful governance discussion on geoengineering must be:

- » International, transparent and accountable, where all governments can freely participate in a democratic manner, open to public scrutiny and the full participation of civil society organisations, indigenous peoples and social movements (especially those most directly affected by climate change), and that is accountable to the United Nations in its outcomes.¹
- » Free from corporate influence so that private interests cannot use their power to determine outcomes or to promote schemes that serve their interests.
- » Respectful of existing international laws including those protecting peace and security, human rights, biodiversity, national sovereignty, and those prohibiting hostile acts of weather modification.
- » Mindful of concomitant crises, especially hunger, poverty, loss of biological diversity, ecosystem destruction and ocean acidification.
- » Guided by the principle of precaution and cognisant that neither the seriousness of the climate crisis nor a lack of scientific knowledge can be used to justify experimentation.

UN Framework Convention on Climate Change (UNFCCC): While the word *geoengineering* does not appear in the texts of the Convention or the Kyoto Protocol, it will likely make its debut in the work of the UNFCCC's Technology Mechanism, the establishment of which was agreed at the Cancun Conference of the Parties (COP) in late 2010 (Decision 1/CP.16 para 117) (UNFCCC, 2011: 19).²

1 Not surprisingly, the logic of global participation to address governance issues is not universally accepted. Lee Lane has written, 'Managing [climate engineering] will entail many choices, and, as knowledge grows, the system may need frequent fine-tuning. Expectations and interests will differ by region, and bargaining costs may be high. With too many players, the process could easily grind to a halt...To be sure, control by the major powers will likely be imperfect, but, then again, locking the world into a CE stalemate pending arrival of global-scale Periclean democracy seems to be an even less appealing option' (Lane, 2010).

2 The IPCC held an expert meeting on geoengineering in 2011, which included all three of its Working Groups. The IPCC is expected to include geoengineering for the first time in its next Assessment Report (AR5), due by the end of 2014. As the IPCC's role is to provide scientific and technical information to the UNFCCC, it is only a matter of time before geoengineering makes an official appearance in negotiating texts at the Convention.

The Mechanism consists of a Technology Executive Committee and a Climate Technology Centre and Network and 'is expected to facilitate the implementation of enhanced action on technology development and transfer in order to support action on mitigation and adaptation to climate change' (UNFCCC, undated).

The UNFCCC is notoriously optimistic vis-à-vis 'advanced and innovative' climate technologies. Its fact sheet, 'Why technology is so important', reflects that optimism: 'Environmentally sound technologies are able to provide win-win solutions, allowing global economic growth and climate change mitigation to proceed hand in hand' (UNFCCC, 2009: 1).³ In other words, technologies will allow us to continue on our current trajectory of increasing consumption and production without suffering consequences. Criteria for environmental soundness have not been established. Implicit in the faith in technology is a concomitant faith in the private sector: 'The role of business as a source of solutions on global climate change is universally recognized' (UNFCCC, 2009:1). The lure of technological quick fixes and the hope of easily available private sector investments are certainly attractive to governments not wanting to risk inconveniencing their electorate or offend Industry. The role of the private sector is, however, a contentious issue.

The UNFCCC emphasises the importance of 'enabling environments' for technology transfer, covering a wide array of issues, including intellectual property rights (IPRs), incentive mechanisms, and the removal of barriers for technology development and transfer. IPRs are particularly hotly contested due to wide disagreement about whether they promote or inhibit innovations in climate technologies. At the Cancun COP, the United States effectively blocked all mention of IPRs, including the option to continue discussing the issue under the UNFCCC.

Geoengineering techniques that 'manage solar radiation' (SRM) could also be implied in the temperature reduction targets adopted by states, for example. Already, some geoengineering advocates (notably ocean fertilisation and biochar advocates) have tried to use the Convention to get unproven technologies accredited under its Clean Development

3 See also Article 10(c) of the Kyoto Protocol: '[All Parties shall...] cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance the transfer of, and access to, environmentally sound technologies...'

Mechanism (CDM), which allows countries with emissions-reduction commitments to shift their obligation to an emissions-reduction project in a developing country. If a technology as potentially harmful as ocean fertilisation becomes accredited under the CDM, for example, the profits to be made by using the oceans as ostensible ‘carbon sinks’ could quickly subordinate the other vital functions they serve, notably – but certainly not uniquely – as food sources.

Convention on Biological Diversity (CBD): So far, the most nuanced and multifaceted multilateral discussion of geoengineering has been at the Convention on Biological Diversity. In 2008, the CBD was ahead of the curve when it adopted a moratorium on ocean fertilisation. At COP 10 in 2010 (Nagoya, Japan), the CBD’s 193 Parties expanded that moratorium to cover all geoengineering technologies,⁴ marking geoengineering’s ‘definite coming of age’, according to *The Economist* (2010). While carving out an exemption for small-scale scientific experiments in controlled settings within national jurisdiction, the CBD decision invoked the precautionary approach to prohibit geoengineering activities until social, economic and environmental impacts have been considered and a proper regulatory mechanism is in place. The CBD has almost universal state membership – the United States, Andorra and the Vatican are the only UN members that have not ratified the treaty – and has a mandate not only to consider biodiversity, but also to involve local communities and indigenous peoples in its processes. A peer-reviewed study (with inputs from geoengineering advocates and those opposing geoengineering) on the impacts of geoengineering on biodiversity was circulated at the 16th meeting of the CBD’s Scientific Body (SBSTTA) in April/May 2012 in Montreal. In its report of the Montreal meeting, the SBSTTA recommended that the CBD’s COP reaffirm the de facto moratorium on geoengineering activities and call for updated/expanded reports on geoengineering’s potential impacts on biodiversity and on the views of indigenous and local communities when it meets in Hyderabad, India, for its 11th meeting (October 2012) (CBD, 2012).

4 See paragraph 8(w) of CBD COP Decision X/33: ‘Ensure, in line and consistent with decision IX/16 on ocean fertilization and biodiversity and climate change, in the absence of science based, global, transparent and effective control and regulatory mechanisms for geo-engineering, and in accordance with the precautionary approach and Article 14 of the Convention, that no climate-related geo-engineering activities that may affect biodiversity take place, until there is an adequate scientific basis on which to justify such activities and appropriate consideration of the associated risks for the environment and biodiversity and associated social, economic and cultural impacts, with the exception of small scale scientific research studies that would be conducted in a controlled setting in accordance with Article 3 of the Convention, and only if they are justified by the need to gather specific scientific data and are subject to a thorough prior assessment of the potential impacts on the environment.’

Rio+20: The outcome of Rio+20 (June 2012), a largely underwhelming document called *The Future We Want*, did, however, include text that could open up space to effectively evaluate geoengineering (CSD, 2012). There is a paragraph acknowledging the importance of global-to-local technology assessment especially in light of the possible deployment of new technologies with unintended consequences (CSD, 2012: para 275)⁵ and a paragraph requesting the Secretary General to make recommendations regarding the establishment of a technology facilitation mechanism to the 67th Session of the UN General Assembly, which begins September 2012 (CSD, 2012: para 273).⁶ More surprising in a document that failed to tackle issues with specificity and decisiveness, the document waved a bright red flag at ocean fertilisation, noting its ‘potential environmental impacts’ and resolving to continue addressing ocean fertilisation with ‘utmost caution...consistent with the precautionary approach’ (CSD, 2012: para 167).

ETC Group has emphasised the need for effective technology evaluation at the UN level for more than a decade. We have envisioned a new International Convention for the Evaluation of New Technologies (ETC Group, 2010), and will continue to advocate for a sound, full, timely, transparent and participatory process that supports societal understanding, encourages scientific discovery and facilitates equitable benefit-sharing.

ETC Group believes that developing countries will welcome early warning, open assessment and facilitated access. Developed countries – including their scientific organisations, industry, and governments – will welcome an end to unpredictability and societal distrust and the establishment of a generalised, non-crisis approach to technology diffusion. Civil society will welcome a transparent and participatory process with both early listening /warning and technology conservation/diversification potential.

5 ‘We recognize the importance of strengthening international, regional and national capacities in research and technology assessment, especially in view of the rapid development and possible deployment of new technologies that may also have unintended negative impacts, in particular on biodiversity and health, or other unforeseen consequences.’

6 Of course, geoengineering is not the only technology field in urgent need of assessment. Elsewhere, ETC Group and others have argued for the need for inclusive and participatory assessments of the health, environmental and socio-economic impacts of other emerging technologies, including nanotechnology, synthetic biology and technologies intended to augment human performance (ETC Group 2006; ETC Group 2007; Wolbring 2009). Equally important, the UN cannot and should not do it alone. ETC Group is working with partners to establish dynamic civil society structures at the regional and inter-regional level that could serve as Technology Observation Platforms (‘TOPs’) with an independent monitoring and assessment capacity to accompany intergovernmental processes.

As part of its engagement with the Rio+20 process and to highlight the need for technology evaluation, ETC Group published a world map of geoengineering. While there is no complete record of the scores of weather and climate control projects in dozens of countries, this map is the first attempt to document the expanding scope of research and experimentation. Almost 300 geoengineering projects/experiments, belonging to 10 different types of climate-altering technologies, are represented on the map. A high-resolution version of the map can be downloaded at <http://www.etcgroup.org/content/world-geoengineering> (ETC Group, 2012).



London Convention/London Protocol: The London Convention/Protocol is a treaty of the International Maritime Organization to prevent marine pollution via ocean dumping; its consideration of geoengineering is therefore limited to those technologies directly involving activities in the ocean. The Convention/Protocol was quick to take up the issue of ocean fertilisation and resolved at its 2008 meeting that its Scientific Groups would establish an assessment framework to identify legitimate scientific research on ocean fertilisation, noting the de facto moratorium on ocean fertilisation agreed at the CBD earlier in the year. The Assessment Framework was adopted at their 2010 meeting. Eighty-seven states are Parties to the Convention; 42 are Parties to the Protocol.

Intellectual property

Adding to the controversy surrounding geoengineering are the critical issues of ownership and control. The politics of patents has always been a divisive issue in various international policy fora.

In the UNFCCC, governments from the global South generally advocate enhanced mechanisms for transfer of useful technologies, including significant financing from developed countries, arguing that existing intellectual property (IP) regimes are a barrier to accessing the technologies necessary to mitigate and adapt to climate change. The North advocates – and generally gets – strong protection of intellectual property, arguing that high profits derived from IP drives innovation and, eventually, the transfer of technologies.

With regard to climate-related technologies, restricting the diffusion of technologies by way of a 20-year monopoly is clearly counterproductive to enabling urgent action. In this sphere IP therefore enables

patent holders to levy lucrative licensing and transfer fees or to press for even more favourable ‘enabling environments’ (for example, liberalised foreign investment and strong domestic IP regimes). As with other high-tech industries, the profits to be made from licensing patented geoengineering technologies becomes a driver for governments to support geoengineering development, research and diffusion – even when in conflict with safety, efficacy or cultural values.

If geoengineering techniques move toward actual deployment, the existence of patents held by individuals and private companies could mean that decisions over the climate-commons will be effectively handed over to the private sector. Indeed geoengineers are already claiming that their patents give them extended commercial rights over the commons in which they operate. In one of several patents assigned to Professor Ian S. F. Jones, founder and chief executive of Ocean Nourishment Corporation, describes how his method of ocean fertilisation will increase fish populations and the patent claims ownership of the fish subsequently harvested from a fertilised patch of ocean (Jones 2008: claim 15).

Some geoengineering patents also effectively privatise indigenous and traditional knowledge, most clearly demonstrable in the area of bio-char. Before the turn of the first millennium, the technique of burying charcoal in soil was widely practised by communities throughout the Amazonian Basin, where it was known as *terra preta*. This technology is now the subject of several patent applications.⁷

As with other technology innovators (in software, biotechnology, robotics), some geoengineers are considering forgoing their intellectual property claims in order to speed up development of the technology. CQuestrate, a geoengineering firm in the UK with investments from Shell Research, is developing a technique to add lime to oceans. The company is a self-described ‘open source geoengineering company’ and declares it will not seek any patents on the technology that results.

Why is geoengineering unacceptable?

- » **It can’t be tested:** No experimental phase is possible – in order to have a noticeable impact on the climate, geoengineering must be deployed on a massive scale. ‘Experiments’ or ‘field trials’ are actually equivalent to deployment in the real world because small-scale tests do not deliver the data on climate effects. For people and biodiversity, impacts would likely be massive as well as immediate and possibly irreversible.

⁷ There are several examples provided in *Geopiracy: The Case Against Geoengineering* (ETC Group, 2010: 31-32).



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- » **It is unequal:** OECD governments and powerful corporations (who have denied or ignored climate change and its impact on biodiversity for decades but are responsible, historically, for most greenhouse gas emissions) are the ones with the budgets and the technology to execute this gamble with Gaia. There is no reason to trust that they will have the interests of more vulnerable states or peoples in mind.
- » **It is unilateral:** Although all geoengineering proposals run into tens of billions of dollars, for rich nations and billionaires, they could be considered relatively cheap (and simple) to deploy. The capacity to act will be within the hands of those who possess the technology (individuals, corporations, states) in the next few years. It is urgent that multilateral measures are taken to ban any unilateral attempts to manipulate Earth ecosystems.
- » **It is risky and unpredictable:** The side effects of geoengineered interventions are unknown. Geoengineering could easily have unintended consequences due to any number of factors: mechanical failure, human error, inadequate understanding of ecosystems and biodiversity and the Earth's climate, unforeseen natural phenomena, irreversibility, or funding lapses.
- » **It violates treaties:** Many geoengineering techniques have latent military purposes and their deployment would violate the UN Environmental Modification Treaty (ENMOD), which prohibits the hostile use of environmental modification.
- » **It is the perfect excuse:** Geoengineering offers governments an alternative to reducing emissions and protecting biodiversity. Geoengineering research is often seen as a way to 'buy time', but it also gives governments justification to delay compensation for damage caused by climate change and to avoid taking action on emissions reduction.
- » **It commodifies our climate and raises the spectre of climate profiteering:** Those who think they have a planetary fix for the climate crisis are already flooding patent offices with patent applications. Should a 'Plan B' ever be agreed upon, the prospect of it being privately controlled is terrifying. Serious planet-altering technologies should never be undertaken for commercial profit. If geoengineering is actually a climate emergency back-up plan, then it should not be eligible for carbon credits under the Clean Development Mechanism or any other offset system.

Conclusions

Geoengineering offers a technological ‘fix’ to the governments and industries that created the climate crisis in the first place and then failed to adopt the policies that would mitigate its damage. The consequences of high-risk geoengineering activities, including real world experimentation, are global. The world’s peoples and governments must debate these consequences before any action outside the laboratory can be countenanced. No unilateral initiative to experiment with these technologies can be considered legally, practically or morally acceptable.

The Geoclique⁸ prefers to publicly discuss research about geoengineering rather than discuss geoengineering itself. Leading spokespersons for the scientific community go to great lengths to insist that advocating for more research is a responsible stance and entirely separate from advocating for deployment. This view is at best naïve and at worst deliberately misleading. Scientists have their careers, professional reputations and, often, financial interests at stake, and they want more funding, more institutional support and a permissive regulatory environment. Also at play are carbon markets, corporate interests, patents, profits, institutional reputations, egos and scientific hubris. All this perverts research and privileges some options while others are left behind. The dollars that are spent on geoengineering research will necessarily be diverted from elsewhere, including from funds for adaptation, already hopelessly inadequate.

We cannot be content with arguments for how geoengineering schemes could theoretically work in their best-case scenarios, and ignore the power politics and slippery slopes that inevitably come with them. Ensuring that precautionary policies for governance have been adopted is insufficient because once the discussion has reached that stage, the genie is out of the bottle. It may sound reasonable – or even responsible – to keep all options ‘on the table’ and prepare for Plan B, but Plan B inevitably makes its mark on Plan A. Already in 2012, Plans A and B are no longer discreet, and we are observing the tendencies towards step-by-step legitimation and, in some quarters, acceptance of geoengineering.

For this reason, the argument about a ‘slippery slope’ of geoengineering warrants serious consideration. In light of the power games at play in the UNFCCC negotiations as well as the refusal of the Annex 1 countries, in particular, to commit to meaningful emissions reductions, even a moderate stance on geoengineering is problematic. The argument that geoengineering buys time (and money) until the transition to a low-carbon economy takes place is likely to have the opposite effect: it will hold back the momentum for change. Such delays in mitigation will increase the overall cost for society. Perhaps the major source of hope lies in the inescapable fact that to deal successfully with climate change, far-reaching change is necessary when it comes to our economic and development models. Either we do that, or we perish. Wishful thinking on geoengineering threatens that political driving force and further work on geoengineering may mean we close the window of opportunity that still exists.

8 Geoclique refers to the group of scientists, retirees and hobbyists actively engaged in the discussion (Kintisch, 2010: 8).

Case Study 1: Ocean fertilisation

Engaging in experiments with the explicit purpose of assessing iron fertilisation for geoengineering is both unnecessary and potentially counterproductive, because it diverts scientific resources and encourages what we see as inappropriate commercial interest in the scheme (Strong et al., 2009a)

The theory

Oceans play a key role in regulating the world's climate. Phytoplankton (microorganisms that dwell on the surface of the ocean), collectively account for half of the carbon dioxide absorbed annually from the Earth's atmosphere by plants, despite their minuscule size. Through the process of photosynthesis, plankton capture carbon and sunlight for growth, and release oxygen into the atmosphere. The world's oceans have already absorbed about one-third of all the carbon dioxide humans have generated over the last 200 years. According to NASA, about 90 per cent of the world's total carbon content has settled to the bottom of the ocean, mostly in the form of dead biomass (Herring, 1999).

Proponents of ocean fertilisation posit that dumping 'nutrients' (generally iron, nitrogen or phosphorous) in waters identified as 'high nutrient/low chlorophyll' (HNLC) – where there are low concentrations of phytoplankton due to the absence of one nutrient – will spur the growth of phytoplankton. Since phytoplankton use CO₂ for photosynthesis, the idea is that increasing the population of phytoplankton will increase CO₂ absorption. They argue that when individual phytoplankton die (the lifespan of phytoplankton is short – a few days at most), they will fall to the ocean floor, leading to the long-term sequestration of carbon at the deeper levels of the sea.

The goal of commercial ocean fertilisation is to profit from selling carbon credits or offsets for the sequestered CO₂ through voluntary or regulated carbon markets.

Phytoplankton populations in the world's oceans are declining as a result of climate change and warmer water temperatures. The amount of iron that is naturally deposited from atmospheric dust clouds into the global oceans (providing nutrients for phytoplankton) has also decreased dramatically in recent decades. Advocates of iron fertilisation schemes believe that iron is the missing nutrient that will restore phytoplankton and sequester 2–3 billion extra tonnes of carbon dioxide every year – roughly one-third to one-half of global industry and automobile emissions. Some regions of the ocean (especially near the Arctic and Antarctic circles) are



Jurvetson

Each 'correction' to ocean water composition could have unintended effects.

nutrient-rich but anaemic – they lack sufficient iron to stimulate plankton growth. With the addition of iron in these presumably otherwise healthy zones, scientists hope to increase plankton growth, thereby increasing the absorption of CO₂. However, US and Canadian scientists writing in the journal *Science* point out, 'the oceans' food webs and biogeochemical cycles would be altered in unintended ways' (Chisholm et al., 2009). They warn that if carbon-trading schemes make it profitable for companies to engage in ocean fertilisation, 'the cumulative effects of many such implementations would result in large-scale consequences – a classic "tragedy of the commons"' (Chisholm et al., 2009). Others note that iron may not be the ocean's only nutrient 'deficiency' – researchers have identified silicate as a crucial component in carbon export, for example – but each 'correction' to ocean water composition could have unintended effects.

Who's involved?

There are both commercial and scientific ventures involved in ocean fertilisation and at least 13 experiments have been carried out in the world's oceans over the past 20 years (ETC Group, 2012). A 2007 experiment near the Galapagos Islands by US start-up Planktos, Inc. was stopped because of an international civil society campaign (ETC Group, 2007). The company was already selling carbon offsets on-line and the company's CEO acknowledged that its ocean fertilisation activities were as much a 'business experiment' as a 'science experiment'. Climos, another US start-up in the field, is still operational. The CEO of Climos has proposed a 'code of conduct' for ocean fertilisation experiments to 'find effective ways for the science, business and carbon market communities to collaborate'. The Ocean Nourishment Corporation, an Australian company run by Ian S. F. Jones with ties to the University of Sydney, had plans to dump urea (nitrogen) into the Sulu Sea but was stopped by the Filipino government in 2007, after over 500 civil society organisations campaigned against the plan (Keim, 2007). The science of ocean fertilisation is increasingly discredited, getting bad press from everyone from the Royal Society to *Nature* to Rio+20.

The 193 Parties to the Convention on Biological Diversity adopted a de facto moratorium on ocean fertilisation in May 2008 and then commissioned a synthesis report of scientific research on the impact of ocean fertilisation on biodiversity. The report emphasised the lack of knowledge about the role of oceans in the global carbon cycle and the difficulty in establishing reliable baselines to test efficacy, in addition to warning about the potential impacts of even small-scale experiments and of commercial ocean fertilisation as a whole. Elsewhere, prominent ocean scientists have explained in detail that 'we know enough about ocean fertilisation to say that it should not be considered further as a means to mitigate climate

change', although they express interest in further research that may involve the addition of nutrients to the ocean in order to understand better marine ecological and biogeochemical processes (Strong et al., 2009b).

What's wrong with ocean fertilisation?

Phytoplankton are the foundation of the marine food chain. Iron may well stimulate the growth of algae blooms but their potential to capture and eliminate any significant amount of carbon is unproven. The list of potential side effects is long:

- » Changes in marine food webs: Artificial plankton production may lead to changes in marine ecosystems at the base of the food chain, of particular concern when ocean ecosystems are already fragile and under stress.
- » Reduced productivity in other areas: Iron-induced blooms may consume and deplete other vital nutrients such that areas down-current from the fertilised area could suffer reduced plankton productivity and carbon fixation.
- » Some scientists have raised concerns that iron fertilisation could in turn deplete oxygen levels at deeper levels of the ocean.
- » Artificially elevated nutrient levels could give rise to harmful algal blooms that produce toxins associated with shellfish poisoning, fatal to humans.
- » The production of dimethyl-sulphide (DMS), methane, nitrous oxide and volatile methyl halides can alter weather patterns unpredictably, cause ozone depletion and open a Pandora's box of impacts on atmospheric chemistry and global climate.
- » Ocean acidification could be exacerbated.
- » Coral reefs can be dramatically affected by tiny increases in nutrient levels, especially nitrogen, potentially provoking the growth of toxic dinoflagellates.
- » Devastating impacts on the livelihoods of people who depend on healthy marine systems, most notably fisher folk.



The 1991 eruption of Mount Pinatubo in the Philippines spewed 20 million tonnes of sulphur dioxide into the stratosphere and the entire planet cooled by 0.4–0.5°C.

Case Study 2: Artificial volcanoes – putting reflective particles in the stratosphere

The theory

This geoengineering technique falls under the category of solar radiation management (SRM) and aims to reduce the amount of sunlight entering the Earth's atmosphere by putting tiny, reflective particles into the stratosphere. The 1991 eruption of Mount Pinatubo in the Philippines spewed 20 million tonnes of sulphur dioxide into the stratosphere and the entire planet cooled by 0.4–0.5°C. Although the idea of artificial volcanoes was first proposed in 1977, the concept has undergone refinement in recent years. Scientists estimate that a 2 per cent reduction of sunlight could negate the temperature rise resulting from a doubling of atmospheric CO₂. Advocates envisage executing this technique regionally, most likely over the Arctic, in order to stall the disappearance of, or even to replenish, ice. The particles – sulphates are most commonly suggested – could be blasted by jets, fire hoses, rockets or chimneys. (More recently, it has been suggested that levitating manufactured nanoparticles could be used to the same end. Ideally, the particles would have a radius of approximately 5 micrometres (µm) with 50 nanometres (nm) thickness; 100,000,000kg of particles would

need to be lofted above the stratosphere annually, assuming the particles would last 10 years (Keith, 2010b).

‘Plan B’ par excellence, artificial volcanic eruptions are promoted as an ‘emergency’ measure that would bring quick and inexpensive results. While some prominent scientists are anxious to move ahead with testing, others, including Rutgers professor Alan Robock, have argued that solar radiation management cannot be tested without full-scale implementation because it is too difficult to distinguish between the effects of small-scale experiments and climatic fluctuations that occur naturally (Robock, 2008).

Who’s involved?

Blasting particles into the atmosphere is now the ascendant geoengineering approach (Blackstock et al., 2009: 13). The US Defense Advanced Research Projects Agency (DARPA) has looked at possible methods for distributing the particles and NASA has researched the impacts of aerosols on climate change.

In 2009, the UK Royal Society, along with its partners, the Environmental Defense Fund and the TWAS – the Academy of Sciences for the Developing World (Italy) – announced the SRM Governance Initiative, which aims to ‘produce clear recommendation for the governance of geoengineering research’. The project is funded by, amongst others, the Carbon War Room, which defines its mission as harnessing ‘the power of entrepreneurs to implement market-driven solutions to climate change’. Bill Gates has also provided the Initiative with funds.

More recently, controversy arose around the proposed UK Stratospheric Particle Injection for Climate Engineering (SPICE) experiment. The project involves four universities, three research councils and several government departments along with the private company, Marshall Aerospace. SPICE researchers intended to execute a pilot experiment blasting water into the sky with the help of a 1km hose and a giant balloon in order to evaluate the technology for possible larger-scale release of sulphur into the stratosphere. More than 70 civil society organisations signed an open letter asking the UK government to cancel the experiment (ETC Group, 2011); the field experiment was postponed for six months and finally cancelled in May 2012 (Hands Off Mother Earth, 2012). The Principal Investigator cited governance issues, including potential conflict-of-interest, as the principal reasons for cancelling the field trial (2012).

What's wrong with artificial volcanoes?

Slowing down or stopping the rate of warming via SRM does nothing to change the levels of CO₂ in the atmosphere, so some symptoms are addressed but not the causes. Even advocates admit that injecting particles into the stratosphere has unknown impacts, and that climate models cannot predict those impacts; nonetheless, research focusing on sulphate injections suggests (Robock, 2009):

- » Impacts could be very different regionally, and several models show risk of increased drought over vast stretches of Africa, Asia and Amazonia.
- » There is a fundamental trade-off between average global temperature stability and regional precipitation patterns, with one study showing that, if this technology were adopted, Northern countries and Southern countries would not agree on the amount of sulphate to be pumped into the stratosphere because of the different impacts.
- » There will be damage to the ozone as sulphate particles in the stratosphere provide additional surfaces for chlorinated gases such as CFCs (chlorofluorocarbons) and HFCs (hydrofluorocarbons) to react.
- » The ability to target particles in the specific areas where sunlight needs to be reduced (i.e., Arctic or Greenland) is highly speculative and it is likely the particles would diffuse.
- » Preliminary modelling suggests a rapid rise in temperature if the programme were to be started and then stopped. Such a rapid rise would likely be more dangerous to life on Earth than a gradual rise.
- » Reduced sunlight could undermine the amount of direct solar energy available (and the efficacy of photovoltaic cells) and disturb natural processes such as photosynthesis.
- » It does nothing to address effects of ocean acidification from rising atmospheric CO levels
- » What goes up still (usually) comes down. The tonnes of particles that would be regularly blasted into the stratosphere will find their way back to Earth again. All the issues related to environmental health and safety associated with particulate pollution, including novel manufactured nanoparticles, remain relevant for intentional polluting schemes.
- » Geoengineering the stratosphere makes it easier for industry to continue its own atmospheric pollution.

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Ecological agriculture, climate resilience and adaptation – A roadmap

Doreen Stabinsky and Lim Li Ching

Agriculture is the most important sector in many developing countries and is central to the survival of hundreds of millions of people. In most developing countries, agriculture, which provides the bulk of employment, is not a commercial activity per se, but a way of life. Most agricultural production in these countries involves small landholdings, mainly producing for self-consumption. Women are the key agricultural producers and providers. Hence agriculture is critical for food and livelihood security, and for the approximately 500 million smallholder households, totalling 1.5 billion people, living on smallholdings of two hectares of land or less (De Schutter, 2008). Smallholdings account for 85 per cent of the world's farms.

Agriculture is also deeply connected with issues of development and poverty alleviation, as about 75 per cent of the world's poor live in rural areas where agriculture is the main economic activity (G-33, 2010). Paradoxically, women, despite playing a crucial role in agricultural production, make up over 60 per cent of the hungry.¹ The World Bank has warned that the agriculture sector must be placed at the centre of the development agenda if the Millennium Development Goals of halving extreme poverty and hunger by 2015 are to be realised (World Bank, 2008). For the poorest people, GDP growth originating in agriculture is about four times more effective in reducing poverty than that originating outside the sector. The large share of agriculture in poorer economies suggests that strong growth in agriculture is critical for fostering rural development and overall economic growth.

However, climate change threatens the livelihoods and food security of billions of the planet's poor and vulnerable, as it poses a serious threat to agricultural production. Agriculture, in the dominant conventional and industrial models that are practised today, is also a major contributor itself to greenhouse gas emissions. There is increasing realisation of the need to address the linkages between development, agriculture and climate change, but there are differences in opinion on how to address these linkages.

This article is based on *Ecological Agriculture, Climate Resilience and a Roadmap to Get There*, (Stabinsky and Ching, 2012)

¹ Hunger stats, World Food Programme, <http://wfp.org/hunger/stats>

There has also been increasing attention directed to the potential of soil carbon sequestration by smallholders to capture carbon dioxide emissions while at the same time generating emission credits on carbon markets. However, such market mechanisms are a smokescreen for developed countries to offset their emissions, enabling them to maintain relatively high levels of emissions domestically while paying someone else to soak up their excess carbon. These mechanisms are unlikely to benefit small farmers; on the contrary, continued emissions are likely to increase the vulnerabilities of poor agriculturalists threatened by increasing temperatures and rainfall variability.



Agriculture, in the dominant conventional and industrial models that are practised today, is a major contributor itself to greenhouse gas emissions.

What are instead needed are immediate and significant emission reductions by the developed countries to prevent further disastrous impacts on food security, as well as a change in their current fossil fuel- and energy-intensive models of agriculture. Linked to this is the question of whether new and additional public funding will be forthcoming for climate change, including for agriculture and, in particular, adaptation efforts, in developing countries.

A focus on the climate challenge to ecosystems and livelihoods rather than on carbon commerce is needed, as the adaptation needs of developing countries are paramount. As such, we should heed the call of the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD)² to the international community and national governments to systematically redirect agricultural knowledge, science and technology towards sustainable, biodiversity-based ecological agriculture and the underlying agroecological sciences.

This is because the ecological model of agricultural production, which is based on principles that create healthy soils and cultivate biological diversity, and which prioritises farmers and traditional knowledge, is climate-resilient as well as productive. Ecological agriculture practices are the bases for the adaptation efforts so urgently needed by developing-country farmers, who will suffer disproportionately more from the effects of climate change. Many answers lie in farmers' fields and farmer knowledge – for example, how to create healthy soils that store more water under drought conditions and how to grow a diversity of crops to create the resilience needed to face increased unpredictability in weather patterns.

² The IAASTD is a comprehensive assessment of agriculture and was co-sponsored by the World Bank, United Nations Food and Agriculture Organization (FAO), UN Environment Programme (UNEP), UN Development Programme (UNDP), World Health Organization (WHO), UN Educational, Scientific and Cultural Organization (UNESCO) and Global Environment Facility (GEF). Its reports, which drew on the work of over 400 experts, were approved by 58 governments in 2008.

This paper proposes a development-oriented agenda on agriculture and climate change, which has at its centre issues of concern to developing countries – including food security, livelihood security and rural development – especially given that developing countries will be disproportionately affected by climate change. As such, it calls for a reorientation of research, institutional, policy and funding support towards ecological agriculture. A simultaneous dismantling of the incentives, including via the current international trade regime, that are propping up unsustainable and high-emissions agriculture is needed. The paper also rejects false solutions that are premised on the soil carbon market, and instead calls for sustainable, predictable and significant public financing to support the transition to ecological agriculture and other necessary strategies for adaptation to climate change.

Climate change and agriculture

The Intergovernmental Panel on Climate Change (IPCC) warns that warming of the climate system is ‘unequivocal’, as evident from increases in air and ocean temperatures, widespread melting of snow and ice, and sea-level rise (IPCC, 2007a).

Agriculture will therefore have to cope with increased climate variability, more extreme weather events and inexorably rising temperatures. According to the IAASTD (2009), climate change, coincident with increasing demand for food, feed, fibre and fuel, could irreversibly damage the natural resource base on which agriculture depends, with significant consequences for food insecurity.

In its Fourth Assessment Report (AR4), the IPCC projects that crop productivity would increase slightly at mid- to high latitudes for local mean temperature increases of up to 1–3°C (depending on the crop) (Easterling et al., 2007). However, at lower latitudes, especially in the seasonally dry and tropical regions, crop productivity is projected to decrease for even small local temperature increases (1–2°C). In some African countries, yields from rain-fed agriculture, which is important for the poorest farmers, could be reduced by up to 50 per cent by 2020, according to AR4 (IPCC, 2007b). Further warming above 3°C would have increasingly negative impacts in all regions.

Recent studies suggest the IPCC may have significantly understated the potential impacts of climate change on agriculture. New research by Stanford University, for example, suggests that production losses across the continent of Africa in 2050 (consistent with global warming of around 1.5°C) are likely to be in the range of 18–22 per cent for maize, sorghum, millet and groundnut, with worst-case losses of up to 27–32 per cent



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Agriculture will have to cope with increased climate variability, more extreme weather events and inexorably rising temperatures.

(Schlenker and Lobell, 2010). In other research, the International Food Policy Research Institute (IFPRI) suggests that rice production in South Asia, one of the most affected regions in terms of crop production, could decline by 14.3–14.5 per cent by 2050, maize production by 8.8–18.5 per cent and wheat production by 43.7–48.8 per cent, relative to 2000 levels. IFPRI concludes that unchecked climate change will have major negative effects on agricultural productivity, with yield declines for the most important crops and price increases for the world's staples – rice, wheat, maize and soybeans (Nelson et al., 2009).

The number of people at risk of hunger will therefore increase, although impacts may be mitigated by socio-economic development. Overall, however, the assessment is that climate change will affect food security in all its dimensions – food availability, access to food, stability of food supplies and food utilisation (FAO, 2009).

The impacts of climate change will fall disproportionately on developing countries, despite the fact that they contributed least to the causes. Furthermore, the majority of the world's rural poor who live in areas that are resource-poor, highly heterogeneous and risk-prone will be hardest hit by climate change. Smallholder and subsistence farmers, pastoralists and artisanal fisherfolk will suffer complex, localised impacts of climate change and will be disproportionately affected by extreme climate events (Easterling et al., 2007). For these vulnerable groups, even minor changes in climate can have disastrous impacts on their livelihoods (Altieri and Koohafkan, 2008).

Conventional agriculture is a major contributor to climate change

While agriculture and food security will be adversely affected by climate change, agriculture is also a major contributor to the climate problem. In particular, the industrial, monoculture model of agricultural production, highly dependent on synthetic fertilisers and massively energy-intensive for technology and transport, is responsible for a significant amount of global annual greenhouse gas emissions.

According to the IPCC, agriculture directly releases into the atmosphere large quantities of three different greenhouse gases – carbon dioxide, methane and nitrous oxide – amounting to around 10–12 per cent of global anthropogenic greenhouse gas emissions annually (Smith et al., 2007). More recent estimates put the figure at 14 per cent (FAO, 2009).

Of global anthropogenic emissions in 2005, agriculture accounted for about 58 per cent of nitrous oxide and about 47 per cent of methane



Climate impacts on agriculture: the role of temperature and rainfall

Climate change poses monumental challenges for agriculture with respect to the climate variables most important to crop plants, temperature and rainfall. Over the next century, temperatures will continue to rise, with more extremes reached more frequently. In many regions, rainfall will become more unpredictable, with changes in both variability (variance in rainfall amounts from year to year) and distribution (number of rainfall events per year and the amount of rain in each event). Both these changes will have significant impact on where and how we grow our food and fibre crops.

While much concern has been raised about the impacts of climate change on rainfall variability and distribution, changes in temperature may cause the most disruption to overall crop yields in the coming decades. Moreover, it is likely that multiple stresses, for example drought and heat stress, will combine to further complicate the immense challenge of adaptation.

Temperature and soil moisture are, of course, related. Higher temperatures lead to increased plant evapotranspiration as well as evaporation of soil moisture. Decreased soil moisture leads to a shortening of the growing period, threatening plants more frequently with low moisture stress towards the end of the season (Rosenzweig et al., 2001; Stanford University, 2009).

Plants have evolved many different biochemical responses to stresses, and research shows that different stresses can trigger different response pathways, which are unfortunately not always complementary. For example, one possible plant response to higher temperatures is to increase evapotranspiration, which cools the plant canopy, a response that is likely deadly in a situation also of water stress. Conversely, in a situation of water stress plants reduce evapotranspiration, thereby heating the canopy. Both heat and water stresses at the same time thereby pose greater threats to the survival of crop plants than either stress individually¹:

Farmers and breeders have long known that it is often the simultaneous occurrence of several abiotic stresses, rather than a particular stress condition, that is most lethal to field crops (Mittler, 2006).

¹ Further elaboration on climate impacts on agriculture are available in the publication *Ecological Agriculture, Climate Resilience and a Roadmap to Get There*, on which this article is based. The publication can be ordered at <http://www.twshop.com/>.

emissions, both of which have far greater global warming impact than carbon dioxide. Nitrous oxide emissions from agriculture are mainly associated with synthetic nitrogen fertilisers and manure applications, as fertilisers are often applied in excess and not fully utilised by crops, such that some surplus is lost to the atmosphere. Fermentative digestion by ruminant livestock contributes to agricultural methane emissions, as does cultivation of rice in flooded conditions.

If indirect contributions (for example, land conversion to agriculture, synthetic fertiliser production and distribution, and farm operations) are factored in, it is estimated that the contribution of agriculture could be as high as 17–32 per cent of global anthropogenic emissions (Bellarby et al., 2008). In particular, land-use change, driven by industrial agricultural production methods, would account for more than half of total (direct and indirect) agricultural emissions.

Conventional industrial agriculture is also heavily reliant on fossil fuels. For example, Bellarby et al. (2008) estimate that total greenhouse gas emissions from fossil fuel and energy use and farm operations and production of chemicals from agriculture are in the range of 0.399–1.656 petagram CO₂e. The large range of values reflects different management practices. Production of synthetic fertilisers contributes the largest amount, followed by use of farm machinery, irrigation and pesticide production.

The manufacture of synthetic fertilisers alone contributes a significant amount of greenhouse gas emissions, between 0.6 and 1.2 per cent of the world's total annual emissions (Bellarby et al., 2008). This is for two reasons: first, the production of fertilisers is energy-intensive and emits carbon dioxide, and second, the production of synthetic nitrogen fertilisers releases huge amounts of the greenhouse gas nitrous oxide – many times more potent than carbon dioxide – into the atmosphere. Alarming, nitrous oxide emissions are increasing precipitously – global emissions from this source are predicted to rise by 35–60 per cent by 2030 (Solomon et al., 2007).

At the same time as they pose a huge climate threat, industrial agricultural systems are highly vulnerable to climate change. The industrial model and the crop varieties designed to work well within it depend on energy- and water-intensive irrigation as well as other fossil fuel-intensive inputs such as mechanised harvesting, fertilisers and pesticides. Highly vulnerable to reductions in the availability of fuel and water, and in the long term economically unsound, the model will not survive (Vandermeer et al., 2009). Nothing less than a system change is needed in the face of the climate change threat.

Ecological agriculture is essential to meet the climate challenge

Climate change will require a range of adaptation approaches across many elements of agricultural production systems, from small changes in the crop varieties grown to decisions to abandon cropping completely. For example, in some rain-fed regions in Africa, there just will not be enough predictable moisture to continue to grow crops; in these areas, agriculturalists may change to livelihood strategies based entirely on pastoralism, or they may need to move to other regions or to cities. In other areas more animals may be integrated into the farming system to reduce dependency on crop production (Jones and Thornton, 2008).

In all areas, farmers working to adapt to climate change will need to adopt new practices that help to increase the resilience of their cropping systems – through building healthier soils, increasing the biological diversity of the system and, particularly in rain-fed regions (where most poor farmers farm), incorporating more water harvesting and water management techniques. As we outline in the final section of the paper, these are practices that governments and other funding agencies must prioritise as they promote transitions to climate-resilient agricultural systems.

Building healthy soils

By increasing the health of soils, farmers can increase the water-holding capacity of the soil and the infiltration capacity – augmenting the speed at which water can percolate into soils and thus the ability to take more advantage of the heavier rains that are expected as a result of climate change

Many well-established agroecological practices increase soil health and fertility, and with these, productivity. Evidence from the Tigray region in Ethiopia shows that compost can increase crop yields significantly; on average, composted fields gave higher yields, sometimes double, than those treated with chemical fertilisers.



Teresa Anderson

(Tirado and Cotter, 2010). Moreover, by building healthier soils, farmers can increase productivity. Given that climatic changes are likely to significantly reduce yields over time, any increase in productivity through better soil health and fertility will serve to moderate the productivity reduction expected. For example, research from 30-year side-by-side trials of conventional and organic farming methods (involving leguminous cover crops and/or periodic applications of manure or composted manure) at the Rodale Institute has shown that organic corn yields were 31 per cent higher than yields from conventional farming in years of drought.³

Many well-established agroecological practices increase soil health and fertility, and with these, productivity. Prominent among these practices is the addition of manure or compost. At the same time that these additions bring necessary nutrients into the system, they also improve the structure of the soil, making it better able to hold onto both nutrients and water. And with an improved soil structure, water is able to infiltrate better and more water is captured during periods of intense rainfall. Evidence from the Tigray region in Ethiopia shows that compost can increase crop yields significantly; on average, composted fields gave higher yields, sometimes double, than those treated with chemical fertilisers (Edwards et al., 2009).

Other ecological agriculture practices that can improve soil structure and increase fertility include growing green manures (crops that are tilled into the soil after they are grown to add nutrients and structure), cover cropping to add nutrients and keep soil covered during a fallow season, mulching and crop rotation (Magdoff, 1998). These are all standard practices in agroecological systems, which work to increase fertility naturally and use the diversity of the system to control pests and diseases, while increasing habitats for pollinators and other beneficial organisms.

Building resilience through diversity

System resilience can be built through increasing biological diversity (Altieri and Koohafkan, 2008). Practices that enhance biodiversity allow farms to mimic natural ecological processes, enabling them to respond better to change and reduce risk. Experience suggests that farmers who increase diversity suffer less damage during adverse weather events, compared to conventional farmers planting monocultures (Altieri and Koohafkan, 2008; Ensor, 2009; Niggli et al., 2009).

In cropping systems, diversity can be increased through increasing the variety of crops grown at one time on the parcel of land, and by add-

³ <http://www.rodaleinstitute.org/fst30years/yields>

ing trees and/or animals into the system. Farmers can also increase the diversity of the system by increasing crop diversity itself – growing different varieties of the same crop that have different attributes, for example, shorter-season varieties that may be beneficial if the season is shortened by inadequate rainfall, or varieties that provide more nutritious forage for animals. Supporting soil health increases the diversity of organisms in the soil, which are responsible for benefits such as increased access to nutrients and reduction of overall disease burden. Diverse agroecosystems can also adapt to new pests or increased pest numbers (Ensor, 2009).

It is important to note here the role of women, as they play a key role in managing biodiversity, and thus in adapting to climate change. For example, women in Rwanda produce more than 600 varieties of beans; in Peru, Aguaruna women plant more than 60 varieties of manioc (CBD, 2009).

Emphasising water management and harvesting techniques

Adapting to climate change will require even more emphasis than is currently given to improving water management and water harvesting in rain-fed regions. Many traditional techniques already in use to improve rainwater-use efficiency can be shared using farmer-to-farmer methods.

For example, the *zai* techniques of the Sahel have received much attention: water pits used by farmers in Burkina Faso and Mali to reclaim thousands of hectares of degraded lands in the last decades. Farmers have become increasingly interested in the *zai* as they observe that the pits efficiently collect and concentrate runoff water and function with small quantities of manure and compost. The practice of *zai* allows farmers to expand their resource base and to increase household security. Yields obtained on fields managed with *zai* are consistently higher (ranging from 870 to 1,590 kg/ha) than those obtained on fields without *zai* (average 500–800 kg/ha). Altieri and Koohafkan (2008) describe a number of other successful traditional water harvesting techniques from around the world actively used by farmers in rain-fed environments.

Increasing productivity in the face of climate change

Given the threats posed by climate change to crop yields, it is important that agriculture practices are able to maintain and even increase productivity. Fortunately, the practices that enhance climate resiliency that are found in ecological agriculture also work to raise productivity, primarily because they improve soil structure and increase fertility.

For example, in a comprehensive meta-analysis, Badgley et al. (2007) examined a global dataset of 293 examples and estimated the average



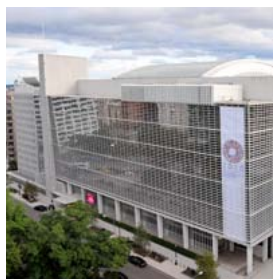
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yield ratio (organic : non-organic) of different food categories for the developed and developing world. On average, in developed countries, organic systems produce 92 per cent of the yield produced by conventional agriculture. In developing countries, however, organic systems produce 80 per cent more than conventional farms. The data also suggest that leguminous cover crops could fix enough nitrogen to replace the amount of synthetic fertiliser currently in use.

Many other specific examples exist of ecological agriculture practices increasing productivity. These are summarised in Lim (2009). Some examples that focus on ecological agriculture practices particularly important for increasing climate resilience are highlighted:

- » Soil and water conservation in the drylands of Burkina Faso and Niger have transformed formerly degraded lands. The average family has shifted from being in cereal deficit of 644 kg per year (equivalent to 6.5 months of food shortage) to producing an annual surplus of 153 kg.
- » Projects in Senegal promoted stall-fed livestock, composting systems, green manures, water-harvesting systems and rock phosphate. Yields of millet and peanuts increased dramatically by 75-195 per cent and 75-165 per cent respectively.
- » More than 1,000 farmers in low-soil-fertility areas in the North Rift and western regions of Kenya increased maize yields to 3,414 kg/ha (71 per cent increase in productivity) and bean yields to 258 kg/ha (158 per cent increase in productivity) as compared to traditional agriculture, by incorporating soil fertility management, crop diversification and improved crop management.
- » Forty-five thousand families in Honduras and Guatemala have increased crop yields from 400-600 kg/ha to 2,000- 2,500 kg/ha using green manures, cover crops, contour grass strips, in-row tillage, rock bunds and animal manures.
- » The states of Santa Caterina, Paraná and Rio Grande do Sul in southern Brazil have focused on soil and water conservation using contour grass barriers, contour ploughing and green manures. Maize yields have risen from 3 to 5 tonnes/ha and soybeans from 2.8 to 4.7 tonnes/ha.
- » The high mountain regions of Peru, Bolivia and Ecuador are some of the most difficult areas in the world for growing crops. Despite this, farmers have increased potato yields threefold, particularly by using green manures to enrich the soil. Using these methods, some 2,000 farmers in Bolivia have improved potato production from about 4,000 kg/ha to 10-15,000 kg/ha.



A number of institutions, most prominent among them the World Bank, have been arguing that the carbon market must be one of the main sources of funding for climate change adaptation efforts.

False solutions: the carbon market threat

Because agroecology provides real solutions to the climate challenge, the coordinated support of agroecological practices and institutions dedicated to those efforts is a crucial objective for the global community to facilitate agricultural adaptation to climate change. These twinned tasks of support and coordination for climate resilience cannot be left to the private sector or a hypothetical market.

Unfortunately, a number of institutions, most prominent among them the World Bank, have been arguing that the carbon market must be one of the main sources of funding for climate change adaptation efforts (see, for example, World Bank, 2010). In this scenario, funding is mobilised for mitigation projects that deliver adaptation co-benefits.

Carbon market basics

There are actually two types of carbon markets: compliance markets and voluntary markets. Where legal emission reduction requirements exist, such as with Kyoto Protocol obligations or within the European Union, regulated entities often have the option to fulfil some of their emission reduction obligations by supporting emission reductions in other parts of the world. They purchase offset credits on a compliance market in fulfilment of these obligations. For example, the United Nations Framework Convention on Climate Change (UNFCCC) Clean Development Mechanism (CDM) generates compliance-grade credits that can be bought and sold on the European Emissions Trading System (EU-ETS) for firms that are legally required to reduce their emissions. However, the EU-ETS does not allow any CDM afforestation/reforestation credits to count as offsets, as these emission reductions are not permanent.

Voluntary markets also trade in offset credits. Corporations wishing to improve their environmental image or individual consumers wishing to offset their consumption will buy voluntary credits. The standards for voluntary credits are often not as rigorous as those credits produced for the compliance market. Most temporary emission reduction credits, such as those associated with forestry projects, are bought and sold on the voluntary market.

Creating agricultural soil carbon offset credits

The World Bank and others argue that it is possible to measure the carbon sequestered in soils through particular agricultural practices and turn this carbon into an offset credit. Entities that buy these carbon credits would at the same time be supporting the adoption of beneficial agricultural practices, such as the use of manure or compost, cover cropping or

mulching fields. These practices are not only mitigation practices but also contribute to the adaptive capacity of farmers. While they are beneficial efforts in their own right, the commodification of the mitigation benefit to be sold as a carbon credit is extremely problematic as well as distracting from the urgent need for climate adaptation in agriculture.

There are a number of fatal flaws with this proposal:

- » A compliance market for soil carbon currently does not exist (ActionAid International, 2011). The CDM does not include soil carbon projects and severely limits forestry projects. Biological carbon in soil and trees is understood to be temporary; in creating the CDM, Parties to the UNFCCC were interested in providing incentives for projects with environmental integrity that would lead to permanent emission reductions. The World Bank and other proponents base their optimism on the market they expect will develop some day – a dangerous faith-based strategy with no empirical evidence to support the claims and altogether inappropriate to the climate challenge faced by hundreds of millions of small farmers around the world.
- » Soil carbon credits are currently sold on the voluntary market; however, the volume of the voluntary market is minuscule compared to the compliance market. Such a small market (several hundreds of millions of dollars currently) cannot provide the billions of dollars required annually for agricultural adaptation alone. Moreover, as more biological carbon projects (forestry, agroforestry and soil carbon projects) are developed and flood the market with temporary credits, the value of credits will fall and with it, revenues for any particular project as well. (The average price of soil carbon currently on the market is US\$1.20/tonne [Hamilton et al., 2010]. Agricultural soils could store roughly 0–1 tonne/ha/year depending on soil type and practices used.) Very few projects in very few locations will benefit from sales of soil carbon credits on the voluntary market. This is not sufficient or sustainable and hence a rather inappropriate strategy for long-term adaptation finance.
- » Carbon sequestered in soils can only ever be considered as temporarily sequestered, limiting the attractiveness to investors of these credits. Any change in practices can lead to reversal, as could an increase in average temperatures due to global warming. An increase in soil moisture will likely increase soil emissions of nitrous oxide and methane, leading to an actual increase in greenhouse gas emissions from soils, rather than sequestration. All these technical factors combine to make soil carbon a dubious commodity for investors interested in something that can be bought and sold numerous times for profit.

- » For revenues from carbon finance to be sustainable, continued emissions are required somewhere in order to generate the market for offset credits (FERN et al., 2011). It means developed countries will continue on a path of emitting greenhouse gases, leaving emission reductions to be undertaken by communities in developing countries. This leaves developing-country agriculture at risk from continued emissions and the ensuing climate change, and reduces the incentive for making the necessary transition to a low-carbon economy in the developed world.
- » And, in fact, mitigation is not necessary for much of developing-country agriculture. As noted earlier, the major emissions from agriculture come from industrial systems dependent on synthetic fertilisers and confinement of animals and their manure in massive feedlots. Mitigation emphasis in agriculture needs to be towards the reduction of developed countries' nitrous oxide and methane emissions, not carbon sequestration in smallholder systems in developing countries.
- » Adaptation will require much more than just the practices that might be supported in carbon markets, such as addition of manure or compost. In fact, tying farmers to particular practices linked with producing soil carbon credits, and the need for farmers to maintain those practices for the length of time that credit is traded, takes away the flexibility that farmers will need to adapt to changing climates (Tschakert, 2004).
- » Finally, the cost of measuring carbon in soils is quite high, and much of the money actually goes to pay the salaries of consultants and technicians from developed countries. Measurement, reporting and verification of sequestered carbon – all of which are necessary to create a commodity that might be attractive to investors – divert already scarce resources towards non-productive ends. Public monies invested in the process create markets that principally deliver private gain for consultants, investors and commodity speculators, rather than adaptation and a reduction in smallholder vulnerability.

For all these reasons, a soil carbon market is a false solution for the sustainable, predictable and significant financing needed to support the transition to ecological agriculture and other necessary strategies for adaptation.

For developing countries, adaptation has to be the main and overriding concern of development and climate policy. Allowing adaptation to happen in an ad hoc manner through projects designed to create carbon credits is worse than bad policy.

A roadmap towards climate resilience and adaptation through ecological agriculture

Adaptation of agricultural systems to changing climates is an enormous challenge that will require the concerted effort of governments, researchers and farmers, working together and starting immediately. Because temperatures will continue to rise over the coming decades, we find ourselves in a race against time, to an unknown destination. The effort to create climate-resilient agricultural systems must be prioritised at all levels – from the local to the global, with an important role for national governments to coordinate efforts. Lack of a well-coordinated and well-funded adaptation strategy threatens the lives and livelihoods of millions.

An essential component of climate-resilient agriculture, as explained above, is ecological agriculture. To move towards climate-resilient agriculture, agricultural practices and policies, at the national and international levels, must be systematically and urgently redirected towards ecological agriculture, in order to ensure it can reach its full potential, especially in addressing this enormous challenge.

Farmers, in particular women, who make up the majority of the world's small producers, must play a key role on the road to climate-resilient agricultural systems. To do so, they must be integrated into the research and development systems and given tools to do their own on-farm research and the capacity to share their knowledge with other farmers in farmer-to-farmer networks. The challenges facing agriculture are too great for the world to ignore the important potential of farmers, their knowledge and their innovation skills to contribute to the creation of climate-resilient agricultures.

In stark contrast, the world seed, agrochemical and biotechnology markets are dominated by a few companies. In 2004, the market share of the four largest agrochemical and seed companies reached 60 per cent for agrochemicals and 33 per cent for seeds, up from 47 per cent and 23 per cent in 1997 respectively (World Bank, 2008). These companies have a vested interest in maintaining a monoculture-focused, carbon-intensive industrial approach to agriculture, which is dependent on external inputs (Hoffmann, 2011). Efforts are needed to address the challenges this situation raises.

Below we outline a roadmap towards climate resiliency with five essential elements:

- » Increasing investment in ecological agriculture.
- » Managing climate risks and reducing vulnerability.



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Farmers, in particular women, who make up the majority of the world's small producers, must play a key role on the road to climate-resilient agricultural systems

- » Stopping climate-destructive agriculture by dismantling perverse incentives and subsidies that promote unsustainable and high-emissions agriculture.
- » Implementing a research agenda for climate-resilient ecological agriculture.
- » Building supportive international policy frameworks.

1. Increasing investment in ecological agriculture

Ecological agriculture practices contribute to resilience and increase adaptive capacity through: improving and sustaining soil quality and fertility; developing and supporting communal water conservation and water catchment systems; enhancing agricultural biodiversity; and developing and supporting agroforestry systems, including conversion of degraded lands to perennial small-scale agroforestry. Governments must specifically reorient agriculture policies and significantly increase funding to support climate-resilient ecological agriculture. They must, at a minimum:



Increased emphasis on the conservation and use of agricultural biodiversity, building healthy soils, and developing and sharing water harvesting and other water management techniques as elements of adaptation strategies is critical.

- » Focus national agriculture policy frameworks urgently and immediately on agricultural adaptation, giving ecological agriculture a central role in agriculture adaptation strategies. In particular, increased emphasis on the conservation and use of agricultural biodiversity, building healthy soils, and developing and sharing water harvesting and other water management techniques as elements of adaptation strategies is critical.
- » Conduct in-depth assessments of agricultural conditions and policies at the national level, to identify both barriers to a transition to ecological agriculture and gaps in policy, and ensure policy coherence such that ecological agriculture is promoted and facilitated.
- » Shift subsidy priorities so that the initial costs and risks of farmers' transition efforts to implement ecological farming practices are borne by public funds (Herren et al., 2011), and encourage more diverse crop production with long-term soil health and improved environmental impacts.
- » Directly fund adoption of agroecological practices that reduce vulnerability and increase resilience, such as soil-fertility-enriching and climate-resilient practices (for example, use of compost to enhance soil health, water storage and soil quality).
- » Devote a large share of their agricultural budget to promoting ecological agriculture. The support should include mechanisms (both traditional extension and more far-reaching farmer-to-farmer networking methods) to train farmers in the best options for

ecological agriculture techniques, the development of ecological infrastructure including water supply, improvement of soil fertility, and the provision of credit and marketing.

- » Enhance agrobiodiversity for climate resilience through supporting conservation and use of local knowledge and seeds; supporting peasant seed systems and community seed banks; prioritising plant-breeding efforts to adapt seeds for future environments, particularly increased temperatures; and banning patents on seeds.

2. Managing climate risks and reducing vulnerability

A key priority for developing countries is to adopt ecological agriculture practices that help their farmers to adapt to climate change. Public financing and transfer of appropriate technologies by developed countries are needed, not only for the adoption of ecological agriculture but also to put in place the required infrastructure, communications and other enabling conditions to ensure that developing countries can adapt to climate change. Governments and funding agencies must:

- » Focus on building adaptive capacity and resilience, thereby reducing vulnerability, and also improve social safety nets to enable farmers and the rural poor to cope with climate-related disasters. This includes implementing a range of policies that support the economic viability of smallholder agriculture and thus reduce their vulnerability – for example, improving access to credit for smallholders; and building and reinforcing basic infrastructure, such as water supplies and rural roads that can facilitate access to markets. Special attention and specific support should be given to women smallholder farmers.
- » Strengthen small-scale farmers', women's, indigenous and community-based organisations to, among other objectives: access productive resources, participate in agricultural decision-making and share ecological agriculture approaches for adaptation.
- » Involve farmers, through these organisations, in evaluating risks and generating adaptation options.
- » Increase investment in national and regional meteorological services, to enhance the collection and use of weather data, and to improve the effectiveness and reach of communication and information technologies to farmers and others in rural communities with up-to-date seasonal weather and long-term climate information, including but not limited to early warning systems.

3. Stopping climate-destructive agriculture by dismantling perverse incentives and subsidies that promote unsustainable and high-emissions agriculture

Current agriculture policies are geared to promoting conventional agriculture practices that are responsible for the bulk of agricultural greenhouse gas emissions. Perverse incentives, including those perpetuated under the current international trade regime governed by the World Trade Organization and bilateral free trade agreements, entrench this unsustainable system. Agricultural incentives and subsidies therefore need to be redirected away from climate-destructive monocultures and climate-harmful inputs (e.g. synthetic fertilisers) towards climate-resilient practices of the small-farm sector. Governments should:

- » Avoid and phase out perverse incentives and subsidies that promote or encourage the use of chemical pesticides, synthetic fertilisers and fuel, or that encourage land degradation (IAASTD, 2009; World Bank, 2008), particularly where these are provided to multinational corporations.
- » Reduce the use of synthetic fertilisers by removing tax and pricing policies that contribute to their overuse.
- » At the international level, modify key market distortions that act as a disincentive to the transition to ecological agricultural practices at the national level in developing countries. These include the significant subsidisation of agricultural production in developed countries and their export to developing countries (Hoffmann, 2011). As long as these conditions prevail and are not significantly altered, it is difficult to imagine how developing-country producers can implement a paradigm shift towards ecological agriculture on the required massive scale.
- » Ensure that trade commitments made at the multilateral and bilateral levels provide developing countries enough policy space to enable support for the agriculture sector, expansion of local food production, and effective instruments to provide for local and household food security and farmers' livelihoods and meet rural development needs. This is needed before farmers in developing countries can start investing in ecological agriculture and climate-resilient practices.
- » Reallocate funds saved from the removal of perverse incentives, and developed-country domestic support and export subsidies, to climate change, in particular for adaptation efforts; this could provide a major source of new and additional public financing to enable developed countries to meet their financial obligations under the UNFCCC (South Centre, 2010), while also providing public financing for adaptation in developing countries.

4. Implementing a research- and knowledge-sharing agenda for ecological agriculture and climate resilience

Too often, national and global agricultural research agendas have been dominated by conventional agriculture approaches and the promise of new technologies. Ecological agriculture has been sidelined, yet it has thrived and has proven successful despite the lack of public support (Pretty, 2006). Farmers' knowledge is a basic and important component of the research/development continuum and research from the scientific community should complement and build on this knowledge. Research and development efforts must be refocused towards ecological agriculture in the context of climate change, while at the same time strengthening existing farmer knowledge and innovation. Moreover, current agriculture research is dominated by the private sector, which focuses on crops and technologies from which they stand to profit most. This research perpetuates industrial, input-dependent agriculture, including synthetic fertilisers, rather than solutions for the challenges facing developing-country farmers. In this light, governments, development agencies and research institutions must:

- » Place ecological agriculture and climate adaptation at the forefront of the international and national agriculture research agendas; this means providing public resources for ecological agriculture interventions. At the same time, address current intellectual property systems that act as drivers towards corporate consolidation and corporate dominance of agriculture research.
- » Focus research and development efforts on climate adaptation and ecological agriculture practices that can contribute to adaptation and resilience. Such efforts should as a priority include research on soil-building practices and water harvesting and management techniques essential to adaptation.
- » Generously fund efforts to conserve crop diversity, both in situ and ex situ. Efforts to pair crop-producing regions with climate analogues for future climates and to coordinate breeding efforts adapted to those future climates are essential and must receive significant funding and research support.
- » Support research on ecological agriculture approaches that mitigate greenhouse gas emissions from agriculture, such as practices that reduce or eliminate the use of synthetic nitrogen fertilisers.
- » Identify research priorities in a participatory manner, enabling farmers to play a central role in defining strategic priorities for agricultural research; and increase networking and knowledge-sharing between farmers and researchers.

- » Reorient research and extension systems to support farmer-to-farmer agroecological innovation; increase the capacities of farmer and community organisations to innovate; and strengthen networks and alliances to support, document, and share lessons and best practices.
- » Ensure farmers have access to information about climate-resilient practices, through both formal and informal means, including extension services, farmers' organisations, climate farmer-to-farmer field schools and exchange visits.

5. Building supportive international policy frameworks

A range of international institutions can make positive contributions by supporting and enabling the adoption of climate-resilient, ecological agriculture, including the Food and Agriculture Organization (FAO), the World Food Programme (WFP), the International Fund for Agricultural Development (IFAD), the centres of the Consultative Group on International Agricultural Research (CGIAR), the World Meteorological Organization (WMO) and the UNFCCC. These institutions should support the range of efforts to be undertaken at national and regional levels described above, and cooperate and coordinate efforts to mobilise necessary resources at the international level. Key policy considerations for the work of these intergovernmental bodies include:

- » The need for sustainable, predictable and significant public funding for ecological agriculture and climate resilience, rather than speculative and volatile market-derived funding. International agencies must play an active role in mobilising public resources.
- » Prioritising adaptation and food security as the overriding objectives for agriculture and development policy in a changing climate. Agricultural adaptation must be unlinked from mitigation, to prevent the diversion of resources to measurement, reporting and verification of carbon stocks.
- » Implementing the key findings of the IAASTD, which call for, among other elements, a redirection of agricultural policy towards supporting ecological agriculture at the national and international levels.
- » Increasing the scale of the work to promote climate-resilient ecological agriculture practices by the Rome-based UN agencies: FAO, WFP, IFAD. This should include technical support to enable countries to make the transition to – and prioritise – ecological agriculture; funding for adaptation; climate-resilient strategies

based on ecological agriculture; and appropriate policy advice that supports the implementation of ecological agriculture.

- » The need for the CGIAR centres to help create and fund research and research partnerships focusing on ecological agriculture, agricultural biodiversity and small farmers in developing countries. The recommendations described in point 4 above are particularly relevant for the CGIAR and its centres.
- » Ensuring the conservation and sustainable use of agricultural biodiversity and related traditional knowledge systems to promote climate resilience, including through the relevant work on agricultural biodiversity carried out by the FAO Commission on Genetic Resources for Food and Agriculture, in line with the International Treaty on Plant Genetic Resources for Food and Agriculture and the Convention on Biological Diversity (CBD). In addition, the CBD, in its consideration of climate change issues, should ensure that ecological agriculture practices that contribute to climate resilience are promoted.
- » Reviving the work of the UN for a global framework for corporate accountability, including the reinstatement of obligations under the aborted UN Code of Conduct on Transnational Corporations.

UNFCCC-specific recommendations

1. Increasing investment in ecological agriculture

- » Annex II Parties⁴ to the UNFCCC must ensure sustainable, predictable and significant public funding for climate-resilient ecological agriculture, through support to the Green Climate Fund, the Adaptation Fund, as well as bilateral and other multilateral climate funding mechanisms.
- » Bilateral and multilateral funding agencies must prioritise climate-resilient ecological agriculture in their agriculture funding portfolios.

2. Managing climate risks and reducing vulnerability

- » Under the Nairobi work programme, the UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) should

4 Annex II Parties consist of the OECD (Organization for Economic Co-operation and Development) members of Annex I but not the countries with economies in transition. They are required to provide financial resources to enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change.

undertake a review of agroecological practices and their contribution to climate resilience.

- » As they develop their National Adaptation Plans, governments should incorporate action in the agriculture sector, in particular provision of support to smallholders in adopting climate-resilient agroecological practices. Developed countries should provide funding for such action, through bilateral and multilateral climate finance and other mechanisms.

3. Stopping climate-destructive agriculture by dismantling perverse incentives and subsidies that promote unsustainable and high-emissions agriculture

- » UNFCCC Parties should initiate in the SBSTA a review of Annex I subsidies, taxes, pricing policies and other domestic measures that support high-emissions agriculture.

4. Implementing a research and knowledge-sharing agenda for ecological agriculture and climate resilience

- » In the context of implementing Article 4.1(c)⁵, Parties to the UNFCCC should initiate an SBSTA review of ecological agriculture approaches that mitigate greenhouse gas emissions from agriculture, such as practices that reduce or eliminate the use of synthetic nitrogen fertilisers, and animal production models that recycle animal waste as fertility inputs in crop production.
- » Under the Adaptation Framework, the Adaptation Committee should coordinate a review of agroecological climate-resilient strategies and technologies for adaptation in agriculture.

5. Building supportive international policy frameworks

- » Parties to the UNFCCC must prioritise agriculture (ecological, climate-resilient agriculture) within the UNFCCC Adaptation Framework, in the Nairobi work programme and the work programme on loss and damage.
- » Annex II Parties should provide support to countries in the National Adaptation Plan process to integrate ecological agriculture into national adaptation plans.

⁵ Article 4.1(c) of the UNFCCC refers to international promotion and cooperation in the development, application, diffusion, including transfer, of mitigation technologies to developing countries in all relevant sectors.

- » The Adaptation Committee should initiate a workstream on agriculture to coordinate work in the sector among the different elements of the Adaptation Framework.
- » The Adaptation Committee should encourage and facilitate transfer of ecological agriculture technologies relevant to reducing vulnerabilities and building of adaptive capacity and resilience in agricultural systems.

Conclusion

The world needs climate-resilient agriculture.

FAO and the World Bank have been promoting a concept called ‘climate-smart’ agriculture. While we agree with many of the ecological agriculture principles and policy recommendations put forward under this framework to support a transition to ecological agriculture, we disagree with the significant emphasis its proponents place on the role of the carbon market for financing agricultural adaptation and mitigation.

Agricultural adaptation and food security in a changing climate will provide the world with a Red Queen challenge – it will take all the running we can do just to keep in the same place, just to continue to produce the same amount of food as we do currently. At times the practices adopted to run in this race will have mitigation co-benefits. However, distracting attention and diverting resources from significant adaptation challenges by trying to achieve a ‘triple-win’ through counting and selling carbon is not only bad policy, it is dangerous.

Prioritising agricultural adaptation and the link to food security must therefore be paramount. This necessary emphasis should be explicitly reflected in the UNFCCC approach to and work on adaptation, both within the context of the recently established Adaptation Framework and within consideration of the means needed for implementation: financial resources, technology transfer and capacity building.

Clearly, ecological agriculture is and should be central to agricultural adaptation. Ecological agriculture is climate-resilient, and the benefits to farmers in developing countries in particular would be manifold. Concerted effort is therefore needed to facilitate the transition to ecological agriculture. Anything less would put the lives and livelihoods of millions at risk.

Climate-Smart Agriculture – ‘Win-win’ or Trojan horse?

Teresa Anderson

Navigating between false and real solutions in climate change is tricky. When it comes to agriculture, one of the major issues of debate is ‘Climate-Smart Agriculture’. This may sound like an inherently good thing, but it is a phrase loaded with specific implications, and driven by interests that could threaten farmers’ rights, climate change and food production. So-called ‘Climate-Smart Agriculture’ may appear to be a gift to developing countries – but its outwardly ecological claims regrettably disguise a dangerous push for industrial agriculture, place the burden of mitigation onto developing countries, and may even contribute to runaway climate change.

Climate-Smart Agriculture – the claims

What is ‘Climate-Smart Agriculture’? According to the World Bank and the UN Food and Agriculture Organization (FAO), who promote it heavily at the UNFCCC, it is a system of agriculture that can give developing country farmers a ‘triple win’. It claims to help farmers to (1) adapt to climate change, (2) increase their yields, and (3) mitigate climate change by reducing emissions or sequestering carbon.

On the surface, this approach would appear to resonate with the demands of farmer and civil society organisations around the world, particularly in developing countries. Instead, these groups have expressed scepticism, concern and outright opposition to ‘Climate-Smart Agriculture’.

Ecological image, industrial practice?

Agroecological approaches must be the basis of genuine climate solutions in agriculture. The proponents of ‘Climate-Smart Agriculture’ point to ecological projects and partners to highlight supposed social, ecological and climate priorities. For example, the International Federation of Organic Agriculture Movements (IFOAM) is a prominent partner. Meanwhile, a pilot project in Kenya that works with 60,000 farmers to reduce fertiliser use and build up soils with compost, manures and crop residues, is held up as evidence of the ‘Climate Smart’ model’s success and ecological credentials. But these examples disguise a different reality and emphasis.

It seems that ‘Climate-Smart Agriculture’ may well promote industrial agriculture – and the very practices and players that cause climate change and farmer vulnerability. Fertilisers are a major contributor to climate change through N₂O emissions and the decomposition of soil organic matter. Dependence on the agrochemical industry’s hybrid seeds has led to the erosion of the indigenous crop diversity that farmers need to meet changing and challenging conditions. Yet ‘Climate-Smart Agriculture’ is clearly and closely linked to partners who promote fertilisers, pesticides and industrial agriculture. These include Yara (the world’s largest fertiliser company), CropLife (the biotechnology lobbying

agency) and the Alliance for a New Green Revolution in Africa (AGRA). Factory farming is a major contributor to Annex 1 emissions and yet 'Climate-Smart Agriculture' appears to be promoting this model under the rubric of 'sustainable intensification' of livestock.

The mitigation money myth

A key 'Trojan horse' element of the 'Climate-Smart Agriculture' package is its promotion of finance from carbon markets. Proponents claim that carbon offsetting mitigation activities in agriculture could fund adaptation and food security co-benefits.

There are many good reasons for rejecting this as a climate strategy. The plummeting price of carbon towards €3 per tonne shows that carbon markets are an 'over-hyped, unreliable, volatile and inequitable source of funding for Africa'.¹ Indeed, farmers participating in the Kenya pilot project mentioned above are expecting to earn significant revenues, while in reality they are projected to only earn between US\$1 and US\$5 per year for the carbon they sequester.² Precious and limited donor public finance for adaptation in developing countries is being diverted towards costly and complex measurement, reporting and verification of carbon stocks for carbon markets. Setting up carbon markets requires huge investment, but generates few returns.

Furthermore, there is a significant risk that agriculture carbon offsets will incentivise 'carbon land grabs' by large-scale investors selling offsets for 'biochar'.³ Genetically modified organisms and in particular GM crops engineered to be resistant to the herbicides 'Roundup' or even 2,4-D could also benefit from soil carbon offsets, as GM companies claim that such herbicide spraying reduces emissions lost from weeding and tilling the soil. GM crops are a highly contentious technology; they have been rejected in many countries including most of Africa and Europe for their socio-economic, environmental and health risks.⁴

Above all, in terms of climate change, carbon offsets at best shift emissions around, and in practice risk increasing net emissions.

'Climate-Smart Agriculture' threatens to impose carbon markets on developing countries, and allow Annex I countries to avoid meeting their financial commitments to fund adaptation. It is therefore promoting a model that would undermine farmers' rights, adaptation strategies and adaptation finance.

1 Letter to African negotiators at Durban COP 17 from 100+ international civil society groups.

2 'Soil Carbon Sequestration for Carbon Markets: the wrong approach', briefing by IATP, African Biodiversity Network and Gaia Foundation. www.iatp.org/files/soil_carbon_durban12-5-11.pdf

3 'Biochar Land Grabbing: the impacts on Africa' briefing by The Gaia Foundation, African Biodiversity Network, Biofuelwatch, 2010. See also Lohmann, 'Climate as Investment', or Mooney, Wetter and Bronson, 'Darken the sky and whiten the earth - The dangers of geoengineering', earlier in this volume.

4 'Clear as Mud: why agriculture and soils should not be included in carbon offset schemes', The Gaia Foundation, 2011.

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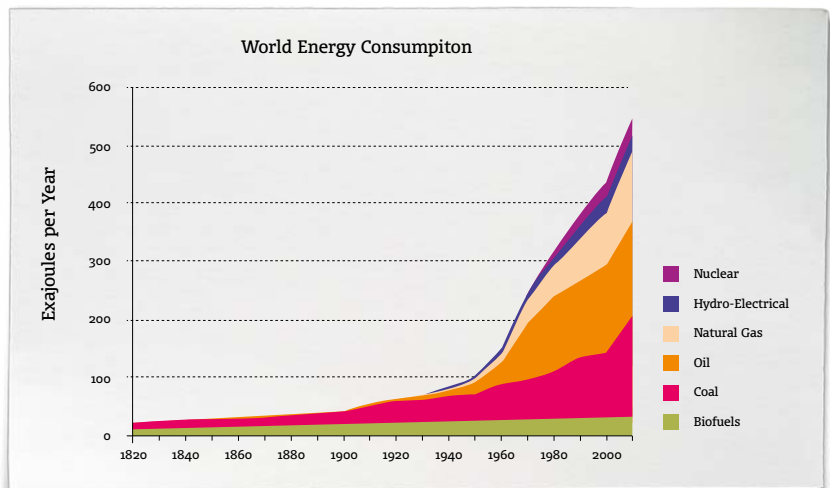
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A global programme to tackle energy access and climate change

Tariq Banuri and Niclas Hällström

Energy access is one of the most urgent challenges confronting the world today. It is essential for promoting sustainable development and tackling poverty and global injustices, and it holds a key to a successful and equitable solution to climate change.

Figure 1: Until the late 18th century, 'muscle and firewood' constituted the main sources of energy. After that, there was a sudden explosion in access to energy – first coal, and later oil and electricity (Tverberg, 2012).



Worldwide energy use multiplied 30 times between the years 1800 and 2000; over the same period, GDP multiplied by a factor of 100. Mobility, as measured by the number of kilometres per person and day, has increased 1,000 times over the last 200 years.

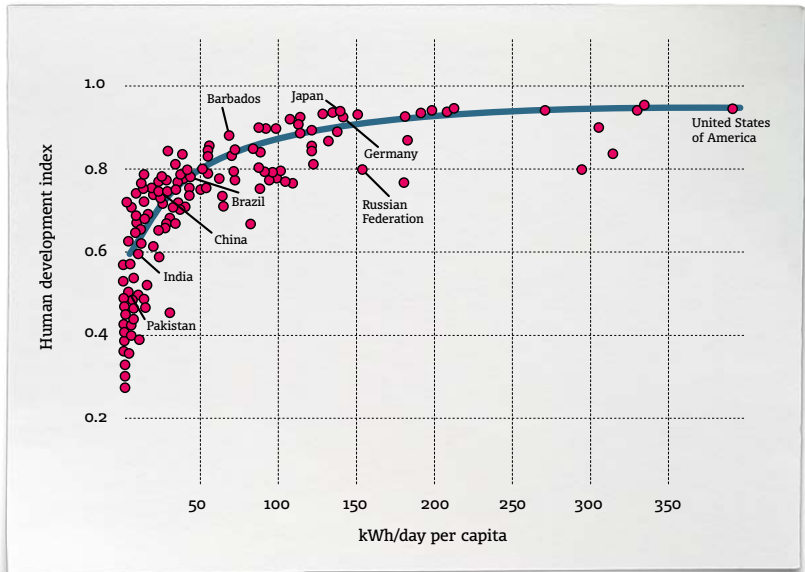
However, 250 years after the technologies with which to access fossil energy sources were first discovered, access to energy remains extremely unequal. Whatever notions or ideals of 'development' one may have, to successfully address many development challenges will depend on the continued expansion of energy services in developing countries.

This article builds on prior work by the authors, including seminars and interventions organised through the Swedish Society for Nature Conservation (SSNC) in the lead-up to the Copenhagen summit and beyond (SSNC, 2009; SSNC, 2010; SSNC, 2011).

The fundamental importance of energy access

Access to energy is extremely unequally distributed, and it is highly correlated (up to a point) with human wellbeing. Measured in kilowatt hours (kWh) per person per day, the global average consumption of primary energy of the richest countries is even more unequally distributed than per capita income. For example, the total primary energy consumption of the United States (250 kWh per capita per day) is almost 50 times that of Bangladesh (5 kWh per capita per day).

Figure 2. The correlation between energy use and human well-being (using the Human Development Index as a proxy).



A distinction can be made between low-, medium- and high-energy consumption countries. In low-consuming countries, where total primary energy use is below 35 kWh per capita per day, the level of human development (as measured by the Human Development Index or HDI) is also low, ranging between 0.3 and 0.7. However, the improvement curve describing the relationship between energy use and human development is initially very steep, so there are major developmental benefits to be had from increasing energy use in these countries.

In the middle category, where energy use is between 35 and 100 kWh per person per day, the HDI ranges between 0.7 and 0.9, and while the energy-development relationship is a great deal flatter – indicating that increased energy use, while beneficial, has less proportional impacts on human development – it still has a positive contribution. Finally, the energy-welfare relation is essentially a flat line in high-energy nations (or strata of societies), those consuming more than 120 kWh per capita per day – a category that includes high-income developed countries as well

as some resource-rich developing countries (with often grossly unequal distribution). In this light, it might therefore be argued that much of the energy being used in United States, Sweden and other wealthy countries is redundant, in that it does not contribute to human development.

Three other features of the energy distribution landscape deserve to be mentioned here. First, the figures on total primary energy consumption mask even greater disparities in the consumption of electricity. No country has ever been able to reach a high score (0.9) on the Human Development Index without universal access to electricity. For instance, electricity consumption (in kWh per capita per day) in the United States is nearly 100 times that of Bangladesh, and over 200 times that of Tanzania.

Figure 3: Overall energy use and electricity use per capita, kWh per day. A Swedish citizen consumes on average 200 times more electricity per day than a citizen of Tanzania (UN-DESA 2009).

Country	Final	Electricity
US	167.07	39.01
Germany	98.09	20.39
Sweden	122.77	45.67
Korea	95.71	21.12
China	29.19	4.61
India	10.87	1.61
Brazil	30.39	6.41
Ghana	10.23	0.79
Tanzania	13.21	0.19
Bangladesh	4.11	0.42

Second, there are critical differences between rich and poor nations in regard to the allocation of modern energy services to different uses. Consider, for example, two statistics on energy consumption for public health in the United States. In 2005, 65.6 billion kWh of electricity, equivalent to 0.6 kWh per capita per day, were used for water purification and distribution and wastewater treatment, far higher than the total electricity consumption of a citizen of Bangladesh or Tanzania. Similarly, in 2003, the 3,040 large hospitals in the US consumed a total of 134.2 billion kWh of energy, including 56.9 billion kWh of electricity, numbers that on a per capita basis (1.2 and 0.5 kWh per person per day) are way beyond the reach of most developing countries.

The scarcity of modern energy services in developing and middle-income countries forces them to make difficult decisions between al-

location for human welfare (household consumption and public health) and economic development and industrialisation. Data from the International Energy Agency suggests that in very poor countries, almost all of the energy (mainly traditional biomass) is consumed by households. Middle-income, emerging economies tend to allocate a disproportionately large share to industry; for example, in China that share is 40-plus per cent, which is much higher than the figure of 20–25 per cent in Western Europe and the United States.

The need for additional energy

Recognising this striking inequality in energy access is crucial. From the previous figures it is abundantly clear that there is a need for additional energy in developing countries, while rich countries can and must scale down their energy use significantly. This translates into reducing the vast disparity in incomes and welfare between poor and rich countries.

But of which kind will this additional energy for developing countries be? The answer is simple: it will be the kind that people are able to afford – and the kind of energy that is accessible as a result of appropriate ownership arrangement and local distribution arrangements, including off-grid/local mini-grid solutions.

Let us first examine the affordability question. While detailed comparable data on energy prices are difficult to come by, the broad patterns are not unknown. The price of energy ranges between 10 and 30 cents (US) per kWh in developed countries¹, at the lower end of this range (about 10 cents) in emerging economies, and even lower, around 4–5 cents in developing countries. The reasons have less to do with supply costs than with affordability and competitiveness.

What people can afford depends, naturally, on their incomes. For instance, in countries with per capita income of under US\$1,000 per annum (say India), which translates as a little more than the proverbial US\$2 per day, an expenditure of 10 per cent of personal income on energy would mean a total of 20 cents for all energy services, electricity, transport, and other fuel for cooking or heating. At 20 cents per kWh, no more than 1 kWh per person per day would be affordable.

In other words, there is a triangular relationship between national income, energy price and energy affordability. Poor countries have no option but to seek the cheapest forms of energy, regardless of environ-

¹ This is a crude aggregation of the final cost of electricity, petroleum, and natural gas. There are wide divergences, of course.

The only strategy that can command the allegiance of both rich and poor countries is one that can rapidly lower the costs of renewable energy. We need to use environmental public investments as a driver.



mental costs. Countries, such as China and India, which have abundant coal and hydropower resources, have invested heavily in them, primarily because they can yield affordable electricity of 3 cents per kWh. Shifting to higher-cost alternatives, such as modern renewables or nuclear energy, which may cost upwards of 15-20 cents per kWh, would imply excluding significant parts of the population from access to electricity.

The strategies that developing countries use to solve the affordability problem are well known. First, in many countries large segments of the population are simply excluded from access to energy. Approximately 2 billion people, half of the population of the developing world, have no access to modern energy. Although from a health and environmental perspective biomass is anything but cheap, the default option for many households as well as countries is to continue to rely primarily on burning firewood instead of electricity or modern fuels.

A second strategy is to lower the quality of the services provided: cheaper buses, inefficient but cheap appliances and technologies.

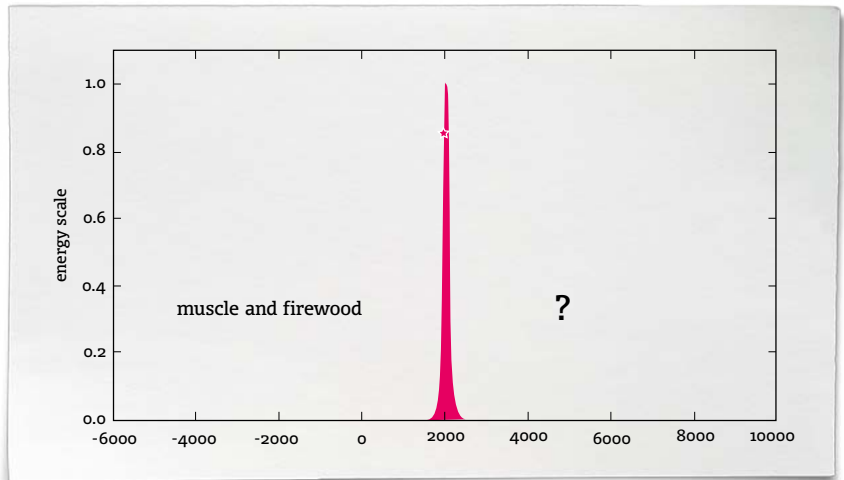
Finally, the most important strategy that developing countries use is targeted subsidies. In developed countries, industry pays less for electricity than households; but in developing countries, low-income households pay even less than industry. Similarly, the prices of diesel and kerosene are kept below those of petrol in order to subsidise public transport as well as the cooking needs of poor households. Notwithstanding the World Bank's ideological opposition to the use of subsidies in developing countries, an excellent World Bank sponsored study (Komives et al., 2005) showed that such 'targeted' subsidies are in fact highly efficient (more so than 'generalised' subsidies that are more prevalent in the water sector).

The climate dimension

These realities of global energy use and its inequitable distribution are key factors when confronting the double challenge: to drastically cut energy-related emissions while ensuring greater energy access for the developing countries.

Energy use is responsible for some 75 per cent of total emissions of greenhouse gases and, what is more, energy emissions are rising much faster than aggregate emissions, especially in developing countries, where growth in energy use outruns energy efficiency. The stark reality leaves us with no choice: the world as a whole needs to relinquish its dependence on fossil fuels and urgently move into a 100 per cent renewable energy future.

Figure 4: The era of fossil fuels – a parenthesis in world history.



There is thus growing pressure also on developing countries to mitigate. If the global concentration of greenhouse gases in the atmosphere is to be stabilised at a reasonably safe level, be it 2° or 1.5°C, total emissions need to decrease drastically over the next few decades – even when the Annex 1 countries assume their long overdue, fair responsibility and quickly move to zero emissions.

The only way to reconcile this need to cut emissions with the need to enhance energy access in the developing countries is to quickly move to renewable energy.

The main strategy with which renewable energy sources within the developed countries has been promoted, has generally been to *raise* the price of conventional, carbon-intensive energy – for example, by the use of carbon taxes or cap-and-trade schemes. A universal carbon tax is perhaps the most popular policy recommendation of the Northern climate community. This sharply contrasts with the only successful strategy carried out in the developing countries: to seek to *lower* the cost of energy by way of targeted subsidies, cheaper technological options (especially coal and hydro), development assistance, and a nudging of global policy towards supportive directions.

The only strategy that can command the allegiance of both rich and poor countries is one that can rapidly lower the costs of renewable energy, so that renewables become the natural choice for both groups of countries. Fortunately, there is a way to achieve this objective: to use environmental public investments as a driver.

From zero-sum to positive-sum

The concept of ‘development’ has emerged only recently in human history. Perhaps more than anything else, its mainstream connotation signifies what economists call a ‘positive-sum game’: the promise of increased income and well-being for all, which in turn is assumed to provide a basis for greater cooperation within society. Where ‘development’ gains have been distributed equitably, it has led not only to greater prosperity, but to improved stability, resilience and social solidarity as well.

Climate policy, on the other hand, is usually construed as a ‘zero-sum game’ where one actor benefits only if another actor loses. Focusing solely on national emissions budgets forces countries to view the process as one in which they can gain only by browbeating or hoodwinking others into accepting a loss. This traditional approach has produced its inevitable outcome – an inability to cooperate or take effective action. An exclusive focus on the fixed nature of the carbon budget will invariably lead to conflict over its allocation.

This is not an argument for refusing to cut greenhouse gas emissions. Rather, it is an argument for examining the tacit assumption behind this approach, that energy technologies are fixed independently of policy choices. It is true that if nothing is done to change the energy infrastructure, the fixed carbon budget will translate into a fixed energy budget, which will in turn translate into a fixed ceiling on both economic growth and welfare. It is also true that in such a case, every country has the incentive to dig in its heels and fight over every gram of the carbon budget.

But there is an alternative. If, instead of focusing on the emissions budget directly, countries were asked to focus on what would be needed to bring the energy infrastructure in line with the dictates of climate *as well* as development, it would provide an incentive to identify areas of cooperation through investment and development. *An investment approach* is fundamentally different from the traditional climate budget approach: it asks how it might be possible to expand the energy budget through investment while cutting the carbon budget. In other words, it converts a zero-sum problem into a positive-sum one.

Investment is also most conducive to a ‘joint’ commitment on the part of countries – where they agree to undertake activities together – instead

of the conventional partiality for unilateral or conditional commitments². The decisive factor is to identify areas for investment that meet climate objectives as well as the national goals of different groups of countries – for example, full employment and energy security in the North, and economic growth and energy access in the South. Within this domain, four criteria can help focus the discussion on appropriate areas for investment further: is there consensus (broad agreement on what needs to be done), momentum (building on steps that are already being taken), transparency (making it possible to assess the effects of policy), and the possibility to work within time limits (setting a deadline for the achievement of the target and the conclusion of the joint action)?

Focusing on the energy sector makes eminent sense, it offers enormous scope for international cooperation.



Energy is a sector in which there is tremendous momentum, consensus and transparency (although one must of course recognise vested and powerful interests such as the fossil industry). In contrast to a purely price-led approach (that is, putting a price on carbon), which caters only to the focus of developed countries on competitiveness (of climate-friendly alternatives), the investment-led approach also accommodates the concerns of developing countries about affordability (of all relevant technologies). It seeks to promote strategic public-sector interventions to pull in private investment. In addition, it argues strongly that investments should be front-loaded in order to avoid the dangers of further 'lock-in' of carbon-intensive technologies, and also in order to take advantage of economies of scale and learning in these emerging renewable-energy sectors. International transfers of finance and technology must be focused in a very targeted manner on achieving this 'big push' for low-carbon technologies.

Focusing on the energy sector therefore makes eminent sense. Investment in renewable energies can allow developing countries to leapfrog to clean technologies; it would stimulate public as well as private sectors in both North and South; it would build upon a range of actions and strategies already in place in several countries; it is most conducive to simple measurement and observation; it comes with a clear target and timetable; and most importantly, it offers enormous scope for international cooperation.

This approach also provides a refreshing contrast to the current climate negotiations, where there is stalemate – and no consensus, momentum

² Unilateral commitments (for example, on emissions cuts) would achieve the desired result if the overall level of ambition were equal to the sum of those commitments. Conditional commitments refer to actions that are undertaken only if an external condition is satisfied, such as, in the case of developing countries, the provision of financing and technology transfer from developed countries. Obviously, most of what has been seen in climate negotiations falls into these two categories.

or transparency. Most negotiators still view climate and development as separate or even contrasting agendas; this is a false dichotomy and reveals only the inability to forge a consensus. After two decades of negotiation, the only outcome is the renegeing of countries even on past commitments. Finally, as is revealed in the desultory obsession with measurement, verification and monitoring, the relationships between inputs and outputs in the mechanisms being proposed are vague, undefined, and subject to manipulation. Developed countries fear that their financial contributions would disappear into a ‘black hole’ of development cooperation budgets with unknown end results; while developing countries fear that the ancillary conditions on funding would mean the abandonment of their developmental aspirations.

Finally, as currently constituted, climate action is completely open-ended. There is no end in sight for any commitments made under the negotiations. When will developed countries be able to conclude financial obligations under the treaty? When will solving the climate issues become a self-sustaining process without the need for external support in both developing and developed countries? No one can say.

What is necessary is a time-bound strategy that creates consensus, builds momentum and is consistent with the demands for transparency. This indeed is the main goal of the work that one of us has been involved with in the UN – and through joint work in other fora (see, for example, Banuri and Opschoor, 2007; UN-DESA, 2009a; UN-DESA, 2009b; UN-DESA, 2009c; SSNC, 2010, SSNC, 2011a; SSNC, 2011b; Atkisson, 2011). Below we set out the key features of such a strategy.

First step – The renewable energy cost target

A reasonable starting point is the formation of a global partnership for agreeing on a shared international target price for renewable energy, say US\$1 per watt of investment or, equivalently, 4 cents per kWh of the cost of delivered energy. These numbers are much lower than current levels, but are well within reach. While renewable energy is, on average (see Figure 4), more expensive than non-renewable alternatives, it is already competitive in some settings.

More importantly, costs have been declining steadily over time. Nowhere is this decline as marked as for wind and solar energy. The main driver of cost reduction thus far is the installed capacity. As the installed capacity has increased, it has enabled producers to benefit from scale economies, standardisation of production, learning by doing, and shift to low-cost locations.

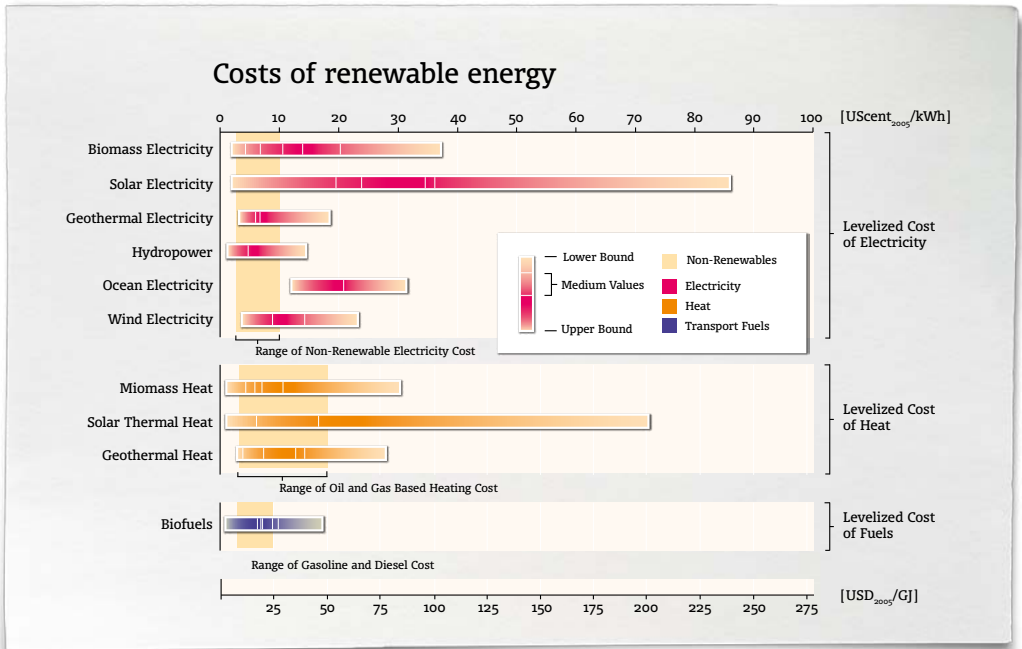


Figure 5: Although renewable energy is already competitive in some settings, costs are still generally higher than current energy prices. (IPCC, 2012)

Moreover, given that the suggested target costs are at parity with the lowest investment costs of coal-based electricity (in China), the achievement of this target would make renewable energy competitive with the cheapest alternative at the same time as making it affordable by the poorest consumer. The achievement of cost competitiveness is a tipping-point, after which the technology will become the default option for future investments without the need for continued subsidies and protection.

Elements of a 'big push' strategy – the feed-in-tariff approach

Once a target is agreed upon, the next step is to ask how it can be reached. As mentioned, the main driver of the declining cost of renewable energy is the installed capacity. This has increased in recent years but has yet to reach the scale where it becomes both competitive and affordable. Our calculations (see UN-DESA, 2009b) suggest that this tipping-point requires an additional 1,000 GW of renewable energy. From the point of view of costs, it may be immaterial whether this capacity is installed in developed or developing countries. But from the point of view of social needs as well as the requirements of efficient deployment of resources, it makes sense to privilege developing countries, especially least developed countries.

The question then is how governments of the world can unite to expand renewables' installed capacity by 1,000 GW. Recent history suggests that the optimum strategy is a globally funded programme to support national feed-in tariff (FIT) systems.

Feed-in tariff programmes have been used in some 50 countries around the world, including Germany and Spain, with extremely favourable results. For example, the recent IPCC special report on renewable energy concludes (IPCC, 2012: 906):

In summary, a number of historical studies, including those carried out for the European Commission, have concluded that well-designed and well-implemented FITs are the most efficient (defined as comparison of total support received and generation cost) and effective (ability to deliver increase in the share of RE [renewable energy] electricity consumed) support policies for promoting RE electricity³

The policy itself is very simple. It is a public guarantee to purchase electricity from new (renewable) energy projects at pre-announced prices. The prevailing form is one where the electricity is fed into the national grid. However, the concept can be adapted to off-grid situations as well. In developed countries, the higher costs of the feed in tariff programmes are passed on to the consumers. In developing countries, this is not possible because of the low incomes of the populace.

The way in which such a programme would work in a developing country is the following: An investor (a public entity, cooperative or private company) is willing to set up a new solar power plant provided it can earn at least 12 cents per kWh. However, consumers cannot pay more than 4 cents per kWh. The government then steps in and offers to purchase the electricity at 12 cents and sell it to the consumers at 4 cents, paying the remaining 8 cents from the budget. In general, given the fiscal crunch faced by developing country governments, they generally choose to limit their exposure by instituting a strict approval regime, thus restricting the scope of the policy to a few plants each year. Thus, the capacity of developing countries for implementing wide-reaching feed-in tariff systems is constrained by the degree of financing that states can afford.

³ See the report (IPCC 2012:906) for numerous citations.

A globally funded programme for national feed-in tariffs for renewable energy

The only way to expand the scale of feed-in tariff programme is through international supplementation of the national subsidies. The justification for the global support is thus straightforward. The programme would provide global benefits in terms of emissions reductions, reduced costs of cutting future emissions, and support for energy access in poor countries. The reduction in the unit cost of energy helps the North as well as the South, because green alternatives for replacing obsolete power plants in developed countries will also be cheaper. By investing in renewable energy for the peoples of the South, in accordance with historical responsibility and common but differentiated responsibilities (CBDR), countries of the North are also making their own transition to a 100 per cent renewable energy future more affordable. In addition, particularly during the early phases of the programme, these investments will also spur employment in green jobs in the North.

When we put together the World Economic and Social Survey report at the UN Department of Economic and Social Affairs (UN-DESA) to present this scheme in 2009, we aimed to make the analysis as conservative as possible. That is, we tried to find the maximum subsidy cost of making renewables competitive. The figure we came up with was a total cost of between 1,000 and 1,400 billion dollars. This works out to an average of US\$100 billion per year over 10 to 14 years.

Is this a lot of money or a little? To put it into perspective, the combined tax base of the Annex 1 countries in 2009 was US\$12.7 trillion. The US\$100 billion needed annually for this programme is less than 0.8 per cent of the money raised by these countries every year, and less than 0.2 per cent of their combined GDP. Used in this way, this sum could effectively help 1.5 billion people gain access to energy, while taking decisive steps towards a renewable energy future in time to prevent all our societies from suffering from climate catastrophe.

The global feed-in tariff subsidy will only pay incremental costs, above what is paid for by consumers plus the subsidy provided by the national government. The higher the level of a country's income, the higher would be the level of affordability as well as what the national government would provide from its own resources. The remainder, inversely related to the national income of the country, would be provided through the global subsidy. In other words, global equity is written into the very structure of the programme.

Another advantage of this approach is its transparency. It is a system based on so-called output-based funding. This is not about simply disbursing money

to developing country governments (with the sometimes accompanying fear of corruption); it is about enabling the funding of concrete projects. And if the project is unsuccessful, so that the energy is not forthcoming, there will be no financial compensation. What a feed-in tariff rewards is actual results on the ground.

Third, this is a time-bound commitment. As the production costs of renewable energy come down, while, at the same time, the incomes of developing countries rise (in part because of increasing access to affordable energy), the need for supplementary financing will continue to dwindle from below as well as above. Depending on how rapidly scales are ramped up, within a span of 10 to 20 years the subsidy will disappear altogether. The question is how quickly we wish to make this transformation happen.

In the context of developing countries and the overriding challenge of energy access, the system of feed-in tariffs provides opportunity to support poor consumers and low-carbon technologies alike. For example, the same principle of guaranteed subsidies and commitment to cover the 'gap' between costs for the installation and selling price to (poor) consumers can be applied to solutions off the national grids. In fact, for large parts of the developing world, this would be the most important aspect of the scheme: the possibility for communities, municipalities and small businesses to invest in renewable energy locally, set up local mini-grids and connect households, public services and small-scale industries with electricity: a 'bottom-up energy revolution'. Furthermore, variations of the feed-in tariff schemes could even support (off-grid) investments that are not even connected to mini-grids, such as new cooking stoves. This capacity of feed-in tariffs to support a rapid energy transformation at both large and small, local scales is one of its many striking benefits, something which is also duly noted in the recent IPCC report on renewable energy (IPCC, 2012: 906).

FITs tend to favour ease of entry, local ownership and control of renewable energy systems...and thus can result in wider public support for renewable energy... Such ease of entry has also proved a powerful means for unleashing capital towards the deployment of renewable energy projects.⁴

How should the global support system for feed-in tariffs in developing countries be set up? There are a number of possibilities but one prerequisite would be a UN-based global fund with a dedicated renewable energy window (this could either be the new Green Climate Fund or a new special fund) that each developing country willing to take part in the scheme can link to after signing up to a set of mutually agreed principles and rules.

4 See report (IPCC, 2012: 906) for citations.

A revolution in the making

‘The only way forward is to create an enabling framework that allows the North to reduce emissions while at the same time the South also makes the transition. I believe feed-in tariffs will be an integral part of that framework.

The issue really is affordability. No one in India is opposed to solar; no one is saying that this transition is undesirable. We know that there are tremendous opportunities, that there are large parts of the country that are not connected to the grid and thus have the potential of leapfrogging the fossil trajectory altogether. No one should be preaching to us about solar energy.

Yet, we need to actually make it work... There are constraints to how much energy supply a country can afford. I come from a nation where 60 per cent of the population have no energy access. Energy supply is a major challenge; and if you want to increase access, you simply cannot have unaffordable solutions that by their cost limit access even further.

The bottom line is that our capacity is limited unless there is a global fair deal in which the North agrees to pay, through a global feed-in tariff, for the transition of the South.’

Sunita Narain, Center for Science and Environment, Delhi (SSNC, 2010:51)

‘My colleagues at the Centre for Science and Environment have proposed off-grid but interactive systems for rural electrification. In this system, like the German roof-top energy revolution, government would provide feed-in tariff incentives for entrepreneurs to set up local solar energy systems. This energy would be fed through mini grids to users – poor and rich would pay costs. It is important to remember that solar energy costs are decreasing – the latest bids for projects put the price at Rs 7 per unit. This is still more than the price of coal- or gas- based power. But while costs of coal and gas will only go up, solar can and will come down.

Energy supply could be decentralised because demand is also decentralised. There could be a revolution in the making. But only if we see the light in the tunnel.’

Sunita Narain in Down to Earth, 15 September 2012 (Narain, 2012)

This is an example of the ‘joint commitment’ strategy whereby the Annex 1 countries provide the funds (according to their capacities and the principle of CBDR) and the non-Annex 1 countries enter stringent commitments to set up national feed-in systems – with mutual benefits in the end. Financing for the fund can be provided in many ways, among them, assessed public contributions from Annex 1 countries, international financial transaction taxes, and use of IMF special drawing rights. What a programme of globally funded feed-in tariffs does is provide concreteness to the debates on climate finance. It speaks to why and how much climate finance is needed for a particular purpose, and shows how funds can be disbursed and made use of in beneficial and accountable ways.

In conclusion: front-loaded investment with strong public support is necessary in order to tackle the dual challenge of global warming and increased and equitable energy access. The fact is that contributions of US\$100 billion in public funds annually over the next 10-15 year period, channelled through national systems of feed-in tariffs with funding based on output, will likely be sufficient to bring about the transition to low-carbon societies and to lower the costs of renewables to the point where subsidies are no longer needed.

However, this scheme must be accompanied by other important elements, including improving energy efficiency, removing perverse subsidies, transferring knowledge, building new national institutions appropriate for implementing the relevant policies, and ensuring the active involvement of civil society and local communities. The endemic risks of diversions and take-over by powerful interests must be taken into consideration at the early design stages. Finally, in order to ensure energy access as broadly as possible and to the communities most in need, decentralised, local solutions must be favoured in the way the feed-in tariff systems are set up. If done well, they can provide inspiring examples of how to successfully connect the local level with the global.

Our message is thus: On the targets for emissions reductions, let the debate continue. But here is a concrete programme addressing issues where basically everyone can agree and where the goals are shared. Let us then find a way of making it happen; let us bring about the transition to clean energy that is in everybody's ultimate interest. If we can expand the scale of renewable energy and lower the costs, we will have solved a considerable part of the problem; and we will have done so regardless of whether or not we agree on national targets.

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Reclaiming power – An energy model for people and the planet

Pascoe Sabido and Niclas Hällström

The following article explores the idea of a bold, front-loaded public investment programme designed to tackle at once the challenges of energy access and climate change. It argues that the concept of 'globally funded feed-in tariffs', which in the last few years has been increasingly endorsed by several major institutions and organisations, represents a highly promising approach. The idea was firmly put on the agenda in 2009 with the publication of the seminal report 'Promoting Development – Saving the Planet' by the UN Department for Economic and Social Affairs (UN-DESA, 2009; see also the previous article in this volume). Other actors, among them Greenpeace International (2010), the World Future Council (2009), Swedish Society for Nature Conservation (2010), World Resources Institute (2011) and Deutsche Bank (2010), have also promoted different versions of the idea.

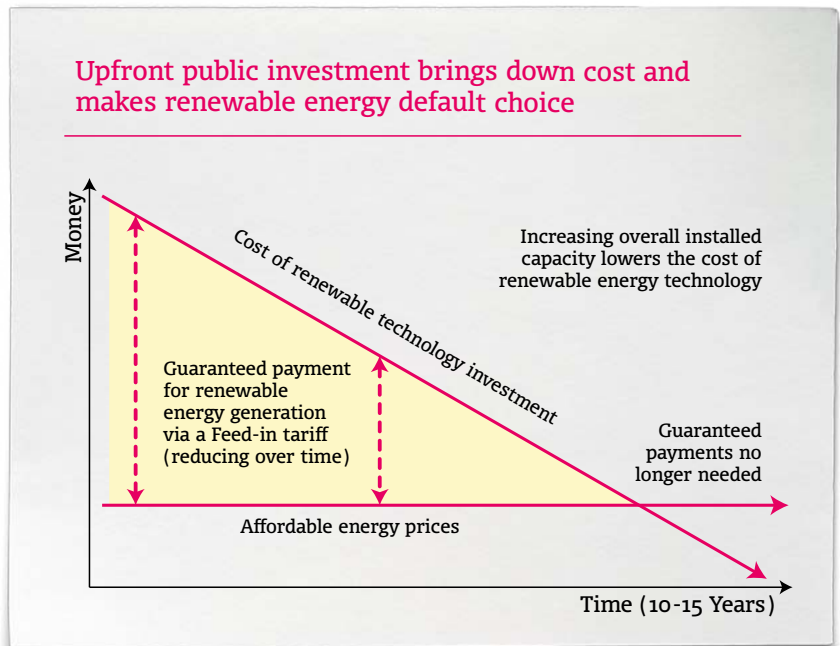
Globally funded feed-in tariffs have the potential to be a genuinely transformative solution to avert a catastrophic climate future by way of stimulating investments in renewable energy towards a 'bottom-up energy revolution' rooted in local initiatives. However, while feed-in tariffs are considered the most effective tool for increasing the uptake of renewable energy technology, they are inherently flexible and entrusts their potential to deliver a socially progressive energy transformation depends on policy-makers and the pressures they face, and is in no way guaranteed. It is therefore imperative that when a programme of globally funded feed-in tariffs is designed, democratic and participatory principles are embedded at the local, national and international level, with a particular emphasis on local control and ownership of sustainable and locally appropriate renewable technologies. The dominance by multinational corporations and inclusion of socially and environmentally harmful energy sources such as large-scale biofuels, biochar and hydropower schemes would undermine the credibility of the scheme in the eyes of the energy poor it professes to help, while also failing to deliver on the goals of tackling energy access and climate change.

As a contribution to the discussion and growing political momentum around globally funded feed-in tariffs, Friends of the Earth England, Wales and Northern Ireland released a report at COP 17 in Durban 2011 with the title 'Reclaiming power: an energy model for people and the planet' (FOE EWNI, 2011). The report sketches out how a model of globally funded feed-in tariffs can be set up in a way that prioritises the requirements of energy access, decentralisation and appropriate technologies. It also suggests a trajectory of how a model of globally funded feed-in tariffs can be scaled up from national or regional to global, beginning with a small pilot scheme which can eventually be incorporated into a UN framework. The following article draws on this report and summarises the key features of the model it proposes.¹

¹ The full report can be accessed at http://www.foe.co.uk/resource/briefings/gfits_briefing.pdf and <http://www.whatnext.org/resources/Publications/FOE---Reclaiming-Power.pdf>

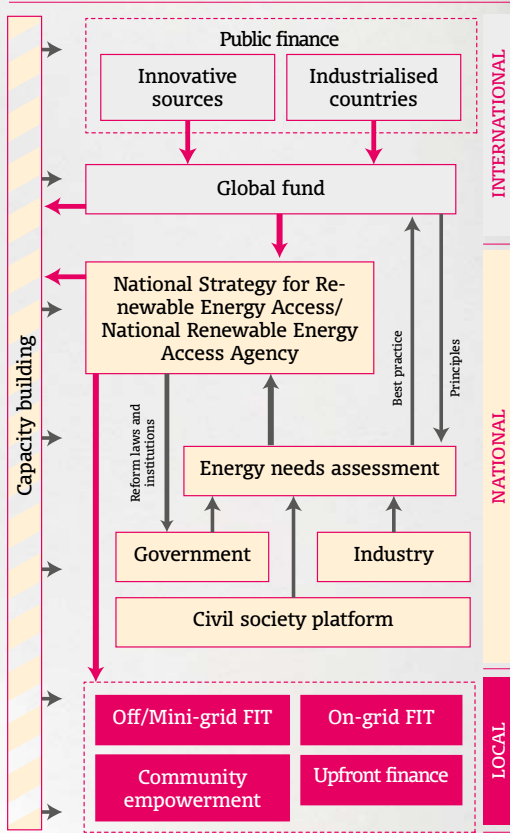
A model for energy access built on globally funded feed-in tariffs

A bold public investment programme over 10–15 years linking a global fund to on- and off-grid renewable energy feed-in tariff plans within countries in the global South could drive the transition to renewable energy. Direct access to upfront capital through a national agency would enable local community organisations in rural and urban areas to generate and distribute their own clean, affordable, decentralised energy, paying back the cost of the appropriate renewable technology through guaranteed payments for generation. Capacity-building and grassroots empowerment at the local, national and international level would ensure energy access remained a core component of the scheme, while promoting community-centred models of governance such as cooperatives.



The feed-in tariffs provide the investor in renewable energy (a community cooperative, municipality or company) guaranteed prices for the energy they produce, covering the difference between production costs and the lower, affordable price for consumers.

Elements of a model built on globally funded feed-in tariffs²



International

Finance: New and additional upfront public finance from industrial countries (including ‘innovative’ sources of finance such as financial transaction taxes and use of IMF special drawing rights) in line with the principles of ‘common but differentiated responsibilities’ (CBDR).

Fund: Establishment of a global fund (a new fund which could eventually become a special window of the Green Climate Fund) that ensures stable, guaranteed flows of financing for national feed-in tariff programmes, including upfront financing for technology investments.

Principles: Participation for developing countries is voluntary. However, globally agreed principles will provide the parameters for the national energy needs assessment and the resulting strategy to ensure key goals and priorities are met – for example, prioritising off-grid energy access, ensuring environmental safeguards and social integrity of projects and technology, and guaranteeing democratic participation.

Governance: Similar to the UNFCCC Adaptation Fund, the multi-stakeholder fund board would have equitable and balanced regional representation, but also include civil society and technical members.

2 For more details on the proposed model, see the annex ‘Digging deeper: Potential features of a model build on globally funded feed-in tariffs’ in the original FoE report: http://www.foe.co.uk/resource/briefings/gfits_briefing.pdf

3 Inclusion of all key stakeholders (government, industry and civil society) is crucial. The Forestry Law Enforcement, Governance and Trade (FLEGT) Action Plan that tackled illegal logging provides one interesting experience to draw on (FERN, 2011). This process created a national network of shared civil society platforms in Cameroon, Congo and Ghana. Through grassroots capacity-building, knowledge-sharing and advocacy among local NGOs, civil society voices were represented at the national level. This process increased buy-in, legitimacy and also scrutiny of all parties, leading to greater transparency.

National

Energy needs assessment: A multi-stakeholder process³ would be carried out, bringing government, industry and civil society together as equals to agree national energy and energy access priorities and the necessary laws and institutions to fulfil them.

Payments for generation: Payments should be long-term and stable, so communities and local businesses can invest in their futures securely. However, the rate for the feed-in tariff subsidy should reduce over time, reflecting falling technology costs and risk. Such a mechanism exists in the German feed-in tariff scheme and ensures renewable generation targets are met but without the government overpaying. It also provides greater certainty to international donors on predicted expenditure and prevents unexpected tariff changes. Rates should be set according to technology and local conditions with higher rates to encourage off-grid or mini-grids and recognition of different needs and ability to pay.

Institutions: Considerable efforts will need to be devoted to build capacity and nationally appropriate institutions that draw on the combined experience of other similar efforts globally.

Local

Finance: payments for on-, off- and mini-grid feed-in tariffs for the renewable energy that has been installed as a result of the scheme. Payment only upon delivery of the energy, creating greater transparency and accountability. Upfront concessional finance through grants and soft loans to local communities and small businesses for clean technology, including clean cooking stoves.

Models of governance and ownership: Different kinds of investment, ownership and management – private, public, social or a combination – will need to be explored in each country to determine what is locally appropriate. Local ownership should be given preference to prevent land-grabbing and the widespread expansion of existing or new energy monopolies. It will also encourage generation of energy as close to where it will be used as possible, reducing transmission losses and not burdening creaking grids. Cooperatives should be encouraged.⁴

Capacity-building and local participation: Local-level capacity-building is essential and has the benefit of bringing down medium-term project costs at a far greater rate than technological change (UNDP, 2011). Grass-roots empowerment and participation should ensure local communities' energy priorities are reflected in the energy needs assessment, rather than assuming what those priorities are. For example, in many cases household electricity will come after other communal needs such as a solar-powered water pump for irrigation and clean drinking water (IIED, 2011). It will also enable communities to be active participants, generating their own energy. Community empowerment involves training and knowledge-sharing, legal advice, advocacy and technical support.

4 The International Energy Agency concludes that cooperatives are the most effective way to spread decentralised mini-grids (IEA, 2011a), and studies by the EC Joint Research Centre show electricity co-operatives have lower energy costs, higher levels of local participation (key for project sustainability) and a more sustainable supply of energy. Positive examples in Bangladesh and Nepal point to their effectiveness both at increasing rural electrification and stimulating micro enterprises through their local development focus and access to finance.

Benefits of the proposed model

Within 15 years, this mechanism could transform the way we think about and produce energy, catalyse development, accelerate the renewables industry globally and keep fossil fuels in the ground. All countries could benefit.

Benefits for the South/developing countries

- » Avoiding the worst impacts of climate change through mitigation.
- » Tackling poverty through increased access to clean, affordable energy and protection from fossil-fuel price shocks.
- » Avoiding 2 million deaths from indoor air pollution as clean cooking fuels and electricity replace dirty, inefficient fuels like coal, paraffin and firewood (WHO, 2011).
- » Avoiding resource conflicts.
- » Greater resilience and adaptation to climate change through access to energy, improved living standards and reduced reliance on climate-vulnerable ecosystems (Johnson and Lambe, 2009).
- » Job creation and industry from locally adapting, manufacturing, installing, operating and maintaining labour-intensive renewable technology; stimulation of local enterprises through access to energy and local finance, which could reverse rural-urban migration.
- » Breaking the monopoly of the current fossil-fuel intensive power providers by decentralising energy generation and access.
- » Democratising energy and strengthening local governance by supporting structures of self-organisation to voice and address local concerns including and beyond energy.

Benefits for the North /developed countries

- » Global mitigation of climate change by moving away from fossil fuels.
- » Own transition cheaper and easier through lowering global cost of renewables and avoiding rising costs of fossil fuels.
- » Lower adaptation costs at home and in climate finance to developing countries.
- » Avoiding resource conflicts.
- » Upfront public climate finance becomes an investment by saving money in the medium term in domestic and international mitigation and adaptation.



- » Greater climate finance accountability as the FIT is only paid on generation of energy.
- » Encouraging green jobs and industry by kick-starting domestic green transformations.
- » Rebuilding trust within the international system as rich, industrialised countries demonstrate leadership, cooperation and respect for UNFCCC principles.

Success of cooperatives in the US and Brazil

United States: Most of rural America was electrified through locally-owned cooperatives – and at break-neck speed.

- » In 1936, nine out of 10 rural homes were without electricity.
- » Franklin D. Roosevelt created the Rural Electrification Agency, a federal lending programme that kick-started most locally owned rural electric cooperatives.
- » By 1953 more than 90 per cent of US farms had electricity, despite the distraction of the Second World War.
- » Today more than 900 rural electric cooperatives bring electricity to 42 million members and continue to outperform all alternative management models.

Rio Grande do Sul, Brazil: Local cooperatives help small-scale farmers achieve energy and food sovereignty in the face of environmentally and socially damaging agribusiness.

- » COOPERCANA (Cane Growers' Cooperative) promotes micro-distilleries that produce ethanol for local vehicles, but only secondary to food production.
- » CRERAL (Rural Electrical Cooperative) has 6,230 associates, providing electricity to its members through micro-hydro and an ethanol micro-distillery; sugar cane is limited to 1 hectare per member, with sugar-cane fibre used for feed-stock and fertiliser.
- » COOPERBIO (a small-scale farmers' movement cooperative) produces ethanol in conjunction with milk, allowing its members to profit from small-scale cultivation.

Danger of false solutions

A model built on globally funded feed-in tariffs has major potential but needs the right features to tackle climate change and energy access effectively.

- » The wrong technology deployed on the wrong scale could cause social and environmental damage. It is therefore essential that a system and its accompanying procedures are designed to guarantee the assessment and scrutiny of technologies in a reliable and thorough manner, with the participation of civil society and affected groups. Governments must ensure that promoted technologies do not lead to undesired, negative effects for people and the environment (that is, no large-scale hydro, biochar, biofuels, or nuclear energy scheme should be eligible for feed-in tariffs). It is particularly important to analyse how different technologies impact on the poorest and most vulnerable groups in society.
- » The wrong focus on centralised grids. Excessive focus on large-scale, centralised generating capacity would fail to deliver energy access, not deliver the efficiencies of local generation, exclude many potentially positive and empowering technologies and reinforce existing energy monopolies within countries.
- » The wrong goal of only tackling energy access or climate change. Building centralised coal-fired power stations in the name of energy access will neither provide access nor tackle climate change by moving beyond fossil fuels. Equally, just focusing on climate change could see large-scale centralised renewables projects that rely on grid transmission and do not tackle access. Clear policy links must be made between climate change and energy access if a global system of feed-in tariffs is going to deliver the necessary transformation.
- » The wrong funding sources via carbon markets would remove stability, starve feed-in tariffs and communities of funds and undermine genuine climate benefits. There is a need for real, dis-bursable public money. Double counting of aid and carbon credits do not provide means to finance the feed-in tariffs.
- » The wrong investors in the form of multinational corporations, creating new monopolies and benefiting from public subsidies at the expense of local and national entities – both public and private. Clear regulations are needed to ensure a diversity of investors, and in particular decentralised, bottom-up initiatives.
- » The wrong trustee in the form of the World Bank, whose links to fossil fuels, Northern governments and carbon markets will inhibit

a collaborative environment. Nor should funding pass through financial intermediaries (such as private equity funds), which introduce new layers of investment risk, reduce accountability and bypass environmental and social lending criteria (FoE-US, 2011).

‘[A] transition to renewable energies might well be carried out on the backs of communities who live in territories that are rich in renewable energy sources, and workers who produce the necessary infrastructure. This is already leading to new forms of exclusion, dispossession, violence, and exploitation, or at best the draining of these resources for use elsewhere. The current expansion of the world-market is an attack on rural communities throughout the world. Whereas fossil fuels and nuclear energy resources are found in a small number of locations, renewable energy resources are broadly spread throughout much of the planet, giving increased strategic importance to large parts of the rural world. This means that the quest for renewable energy could result in a new and perhaps unprecedented landgrab by companies and investors, which would create the potential for even more extreme patterns of displacement and appropriation of land than other forms of energy have done.

This is already occurring with alarming rapidity and brutality due to the rapid global expansion of agrofuels produced for trade in the world-market (rather than for local community-controlled consumption). To a lesser extent, it is also occurring in relation to wind. In particular, the dependency of urban areas (where large quantities of energy are consumed) on rural ones (who produce it) is becoming an increasing point of conflict. Therefore renewable energies, in addition to offering emancipating possibilities for constructing autonomous and decentralized energy systems, also represent a new threat for rural communities (especially indigenous and Afro-descendent), making them increasingly vulnerable to loss of control of their territories and even displacement.’

Kolya Abramsky, in Sparking a Worldwide Energy Revolution (2010: 644)

Ways forward

Support for a global scheme requires evidence of success. Establishing a bilateral or small multilateral pilot initiative between forward-looking countries in the North and South could embed the right principles and mechanisms, while advocacy and multi-stakeholder engagement alongside the pilot would ensure a participative process in the eventual design of the fund and how it operates. Once global support is secured a few years down the line, the scheme should be scaled up and incorporated within a UN framework.

Beginning now

The window to tackle the threat of catastrophic climate change is closing, while the political momentum for universal access to energy is growing, making this the key moment for a programme of action built on globally funded feed-in tariffs. But any such programme would need to ensure a comprehensive and coherent approach to maximise and amplify benefits across both objectives. Conversely, a lack of cohesion could further entrench current trends such as fracking for shale gas or deep-sea Arctic drilling, resulting in severe environmental and social costs. Current policy approaches and initiatives are failing to address climate change and energy access adequately and lack the framework for the critical, transformative action that is needed.

‘[S]truggles over territory, labor, and ownership, are all becoming central in shaping the global expansion of the renewable energy sector. A transition, predominantly based on the collective and democratic harnessing of renewable energies, has the potential to result in a significant decentralization of energy production and equalization of access. Communities and individuals could assume greater control over their territories, resources, and lives enabling an emancipatory social change that is based on the construction of autonomous relations of production, exchange, and livelihood. This is especially so for rural communities, which, in theory at least, are ideally located to benefit from renewable energies and to lead the way, since they are richest in natural resources such as wind, sun, biomass, rivers, seas, animal wastes, etc. And this can happen astonishingly fast if communities are given the appropriate tools.’

Kolya Abramsky (2010:644)

Transformation requires tackling those economic and political forces with a vested interest in reproducing the current ineffective energy model. We have sufficient technology and knowledge to make the transition, but are not acting. For example, studies from Mozambique show that renewable resources could easily satisfy the energy needs of the country, including the 80 per cent of the population without access to clean, affordable sources. Yet, national energy policy is still based on an expansion of fossil fuels and large-scale hydroelectric power (Hankins, 2009). Similar examples are common throughout the global South. We need political leadership to break our fossil fuel dependency and transform the way we think about and use energy, allowing the world to develop cleanly and sustainably. A model of globally funded feed-in tariffs could well represent the most effective way of achieving this. Delaying the transformation carries huge financial costs. According to the IEA, each year that passes without embarking on an ambitious and necessary path of emissions reductions adds another US\$500 billion to the bill, more than double the total investment in green technology in 2011 (REN21, 2011). The human

and environmental costs of missing the opportunity to steer the world towards 100% renewables and energy access would be immeasurable. No more sleep walking towards the precipice, no more endangering the future of our planet and all those that inhabit it – human or otherwise; we have the opportunity to create a far better, far more sustainable and far more equitable future. But it must start now.

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Bangkok, October 1, 2009

Center for E



WATER THREATENED BY
CLIMATE CHANGE

NO WATER JUSTICE
WITHOUT GENDER JUSTICE

GW
GENDER AND WATER
ALLIANCE

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WHILE TRYING
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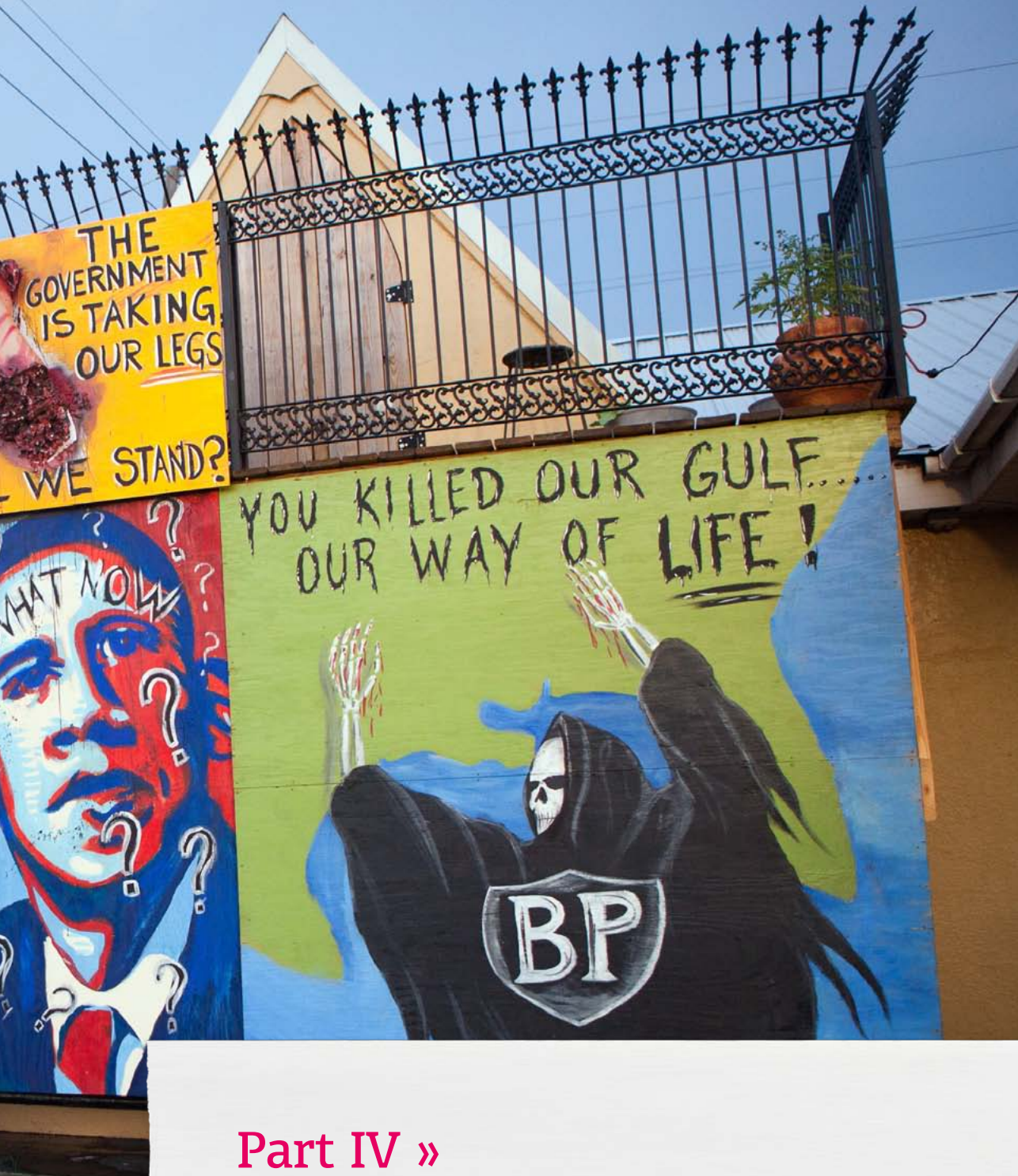
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Louisiana
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Bobby Jindal
For President

LAFOURCHE TOOL



Part IV »
Movement Towards Change



Beyond patzers and clients – Strategic reflections on climate change and the 'Green Economy'

Larry Lohmann



Patzer: an amateurish blunderer, probably from the German patzen, to bungle.

Chess freaks have a word for it. In the insulting, machista idiom of the traditional chess world, it's called 'being a patzer'. One mark of the patzer is to fall into avoidable traps: to walk into fool's mate, grab the poisoned pawn, neglect strategic development in favour of quick gains.

In the chess game on the left, White (the master) surprises Black (the patzer) by giving away a piece. The white bishop takes the black pawn at the upper right of the board, giving check but leaving itself open to capture by the black king.

Black thinks for a moment, then decides to take the offered bishop. What's not to like about the deal? Black gets the equivalent of two pawns for free. It may not be a won game yet, Black knows, but the capture is surely a step in the right direction: a material foundation for an eventual victory. A bishop is a bishop: how can you turn it down?

Then, with a barely-concealed, evil grin, White brings down the chopper, moving her knight to the fifth square from the bottom in the second column from the right. Black may not know it yet, but the game is over. No matter what Black does, White will now triumph in six or seven moves. The temporary advantage in material that Black has gained means nothing because Black has lost.

Climate politics

In the United Nations and other international forums, environmental politics has long been a chess game full of masters preying on patzers, setting up situations in which they seem to be giving something away when they are actually manoeuvring their way into a long-term positional advantage.

When United Nations delegations assembled in Kyoto for their annual meeting on climate change, it seemed international politics might be entering an interesting new phase.



UN Photo/Frank Leather

Turn the clock back to 1997, for example. When United Nations delegations assembled in Kyoto for their annual meeting on climate change, it seemed international politics might be entering an interesting new phase. Alarmed at global warming, Southern countries had been insisting that the industrialised North take responsibility for a global crisis of which it had been the main cause. The United States, preoccupied with maintaining what geographer Mazen Labben calls a global ‘militarized market’ dependent on fossil fuels and the massive, climate-changing carbon emissions they produce, found itself particularly on the defensive.

But an instinctively astute strategic move worthy of any chess master succeeded in turning the tables. In Kyoto, the US dangled the offer of signing up to emissions cuts in return for an international commitment to carbon trading. Exhausted by the marathon negotiations, Southern countries accepted the gambit, facilitating, largely unwittingly, a technopolitical process that led to the multiple defeats that are the subject of this article.

Of course, nobody had been under the illusion that getting the US or any other country to sign up to Kyoto’s relatively trivial emissions cuts was much of a prize, any more than your average patzer believes that a two-pawn advantage guarantees victory in chess.

But like all good patzers, the UN negotiators on the receiving end of the US stratagem – as well as the politicians who stood behind them and the journalists and NGOs who accompanied them – tended to be linear thinkers. They told each other that this was maybe at least a ‘small first step’, ‘a step in the right direction’, ‘better than nothing’, a ‘foundation for something bigger’. Surely, they insisted, having the US, the world’s worst polluter, on board even an inadequate agreement was better than not having them participate at all. The condition for US participation – carbon trading – might be morally or aesthetically distasteful, but should not, they reasoned, be a deal-breaker. Let’s not be ‘fundamentalist’, they urged. Let’s not allow the best to be the enemy of the good. Politics is the art of the possible. Step by step.

In the process, the long-term significance of the carbon trading quid pro quo was missed – to say nothing of the need to look beyond mere emissions cuts towards the imperative of keeping remaining fossil fuels in the ground permanently. Asked why the Philippines went along, for example, Tony La Viña – a negotiator who, ironically, prided himself on his ‘realism’ – confessed that, at that point, all he cared about was that the US took on ‘binding targets’, no matter how that goal was achieved (La Viña, 1997). Like countless others, La Viña – perhaps conditioned by an earlier stint at Washington’s World Resources Institute, a bastion

of neoliberal thinking about the environment – had fallen for the idea that the real political stakes were CO₂ targets and carbon trading was a mere technical tool – an efficient ‘instrument’ for achieving them. ‘Carbon trading is just a wave,’ as one North American climate activist later explained. ‘Targets are the water.’

Indeed, even many of the US’s own climate policy-makers may well at first have underestimated the importance of the trading aspect of the Kyoto deal. The most far-sighted undoubtedly understood that a carbon trading proposal would, if approved, help protect fossil fuel use as well as provide speculative new business opportunities – and that, even if rejected, it would still help to put the Clinton regime on record as having made some effort on global warming. Yet others held a different view. The faction of US climate thinking represented by ExxonMobil and George W. Bush, for example, was famously unresponsive to the pleas of speculators such as ENRON that Kyoto’s carbon market be ratified, believing that the constraints represented by emissions targets would outweigh the benefits of trading to the fossil fuel economy; it was only much later that some industrial interests realised how effective the carbon markets could be in entrenching coal, oil and gas. On the other side of the narrow US political spectrum, some green policy advocates may also have genuinely thought that Kyoto’s emissions targets represented an environmental advance unaffected by the trading component of the deal, which was perhaps viewed as a mere sop to business and a hostile and largely climate-denialist US Senate. In any case, like a chess player pretending to be overcome with nervous second thoughts after sacrificing her bishop, the US was able to put on a convincing performance – feigned or not – of attaching greater importance to Kyoto’s nominal emissions cuts than to the carbon market that was the other component of the deal.

Small wonder that the players on the other side of the chessboard could hardly keep their eyes off the bishop either. If so many in the US corporate world were worried about being assigned ‘legally-binding targets’ – so went the patzer logic – surely setting targets and caps must be the key to everything. And surely if targets could be set, then means would be found to meet them, and then new, stricter targets could be imposed, in an inevitable ratcheting process (MacKenzie, 2007), until the ultimate goal – 350 parts per million, 2 degrees centigrade of warming, or whatever – would be reached.

Only years afterwards did the deeper game loom into view. With the sinking feeling of marks who come to realise they’ve fallen for a ‘long con’, many of the patzers eventually saw that while they had been preoccupied with getting the US and other industrialised nations to sign up to

so-called ‘legally-binding emissions cuts’, on the other side of the chessboard their opponents had used carbon trading to arrange their pieces in a position that made it increasingly difficult to address climate change at all. Like the chess master’s offer of the ‘poisoned bishop’, the US’s offer to accept emissions targets can be seen in retrospect as having been a sacrifice performed in order to open up the position for bigger operations.

What the effects of these operations were emerged only gradually. First, Kyoto’s minimal cuts did not turn out, as the number-fetishising patzers had presumed, to be a prelude to sharper reductions, which were never agreed, but at most to lead to national-level legislative processes of inducing the nominal scarcity required for a pollution market. Nor were even the preliminary ‘binding cuts’ of Kyoto actually binding when it counted – first the US, then Canada, then Japan and other countries made it clear that they were free at any time to withdraw from any agreement that actually threatened fossil fuel use. The ‘binding cuts’ were further undermined through the widespread use of the offsets that carbon trading made possible, as well as the growing ‘offshoring’ of emissions (see, for example, Peters et al., 2011). Still later the US spearheaded an agitation to abolish the idea of targets altogether. By 2012, with not just fossil fuel use, but the rate of fossil fuel use, increasing, the struggle was on to keep any industrialised country on course to make any reductions at all. The ‘ratchet’ that the patzers had envisaged turned out to be a greased cylinder devoid of teeth.

Yet all the while, most patzers kept thinking like patzers, continuing quasi-autistically to count molecules and formulate targets, while waiting and hoping for more free bishops – with which they were amply supplied from early on in the game. Employing a classic manoeuvre, growing carbon trading establishments in the EU, international development institutions, Washington NGO circuits, and assorted research and lobbying bodies were soon doing everything they could to entice patzers into thinking that they could exercise progressive ‘policy influence’ by pouring effort into carbon market design and carbon market reform. ‘We know carbon trading has problems,’ market proponents put on a great show of conceding. ‘Help us make it better!’ On the whole, the patzers were only too happy to take up the poisoned offer. Some dutifully produced a stream of ineffectual ‘standards’, ‘safeguards’ and ‘principles’, or demanded that more attention be paid to ‘governance’ and ‘participation’, telling themselves that in doing so they were providing ‘damage control’. Others expended their energies, with paltry or nonexistent results, on urging that stricter caps be set, that allowances be auctioned instead of being given away free, that the role of offsets be reduced, or that ‘carbon cowboys’ be curbed (see for example Coelho, 2012). Still others allowed

themselves to be seduced into thinking that carbon trading could be ‘leveraged’ or ‘subverted’ to secure land rights, human rights, technical support or hard cash for worthy grassroots initiatives. (‘No rights, no REDD!’ went one slogan, referring to programmes to generate carbon pollution rights by Reducing Emissions from Deforestation and Forest Degradation.) The result was that for 15 years, patzers tended to neglect the real task of climate action: making common cause with the social movements that actually had practical, concrete stakes in countering the interests of fossil-fuelled productivism. In many cases, the patzers wound up unwittingly conspiring against the interests of grassroots networks to which some imagined they were still loyal and accountable.

That constituted an obvious triumph for many US, EU and other fossil-dependent elites, whose overall power advantage over the global majority in climate politics tended to grow every year. Yet to understand the subtler (and no doubt partly inadvertent) genius of the original US gambit, it will be useful to go a bit deeper, by sketching three key processes of positional consolidation that it made possible: the institutionalised defossilisation of the global warming problem; the institutionalised deresponsibilisation of industrialised countries; and the financialisation of climate change action.

How it was done, part I – Entrenching goal change in institutions



By inducing the international community to accept carbon markets, US and other industrialised-country leaders were able to promote a ‘fossil forever’ agenda while avoiding the mistake of openly advocating it.

Suppose US or other industrialised-country leaders had stated publicly that, in their view, fossil fuels remained so central to the productive exploitation of labour and other aspects of ‘nature’ that there was no choice but to extract and burn the last drop of oil and the last lump of coal no matter what the global warming cost. They would thereby have put themselves in a weak debating position. No one comes out and says such things at the UN or anywhere else, even if many think it. But by inducing the international community to accept carbon markets instead, they were able to promote a ‘fossil forever’ agenda while avoiding the mistake of openly advocating it.

Carbon trading made this feat possible because it changed the goal of climate action from keeping remaining fossil fuels in the ground to meeting targets for the emission of CO₂-equivalent molecules. This change was made all the smoother in that, for the technocratic sensibility widespread at the UN and in the world of middle-class climate activism, it did not appear to be a change at all. Technopolitically unsophisticated patzers tended to accept at face value the neoliberal commonsense that assigning a price to CO₂ molecules would automatically incentivise the phase-out of fossil fuels.

Under cover of this ideology, carbon trading was then able to make its contribution towards accomplishing the opposite – protecting, perpetuating and promoting fossil fuel use for a decade and a half, during which time greenhouse gas emissions continued to increase. For example, under cover of ‘efficiency’ claims, a variety of institutions were set up that made it possible for polluters to meet their emissions targets by substituting cuts in other gases for CO₂ cuts, substituting photosynthesis for fossil emissions cuts, or substituting hypothetical cuts for actual cuts (see for example ICIS, 2012; Szabo, 2012). Competition to find the cheapest substitutes contributed to a decline in pollution permit prices to a level far below what would be environmentally meaningful – a trend amply reinforced by the way carbon markets were designed as the ‘only commodity market in the world where demand varies in real time but supply is fixed years in advance’, to quote Mark Lewis at Deutsche Bank.



Carbon markets interfere with more effective tools for cutting emissions and tackling fossil fuel dependence

Carbon trading, like other pollution trading schemes in the past, also selected for low-cost substitutes for green innovation, disincentivising research and development investment in clean technologies (Taylor, 2012; Taylor et al., 2005) and militating against the long-term investment planning needed to address structural transition under conditions of uncertainty. As Jerome Whittington notes, ‘carbon markets, while promising to tie climate objectives to risk-taking entrepreneurialism, are perhaps more closely aligned with moving around and forestalling investment and innovation’ (Whittington, 2012). The delays in transition for which carbon markets select, in turn, multiply the ultimate costs of moving to a non-fossil society, further obstructing climate solutions; the International Energy Agency, for example, estimates climate investment postponed beyond 2020 will cost 4.3 times investment now (IEA, 2011). Because carbon markets were artificial constructs created by the state, they also introduced unlimited opportunities for rent-seeking and gaming, resulting in market gluts and, again, low prices, as well as windfall profits for heavy greenhouse-gas polluters (see for example Sandbag, 2010) – profits that were then often ploughed into additional fossil-fuel development. At the same time, carbon markets interfered with more effective tools for cutting emissions and tackling fossil fuel dependence (see, for example, Helm and Doward, 2012; Wynn and Chestney, 2011). What the patzers had been persuaded to believe was a ‘neutral instrument’ for global warming mitigation, in other words, was actually a game-changer furthering fossil fuel interests. The misidentification of nominal molecule trading with global warming action meanwhile made it easy for trading proponents to gauge environmental success, falsely, by the size of the carbon market.

How it was done, part II – Deresponsibilisation through institution-building

Over the years, the US has repeatedly insisted that it will never take any special responsibility for climate change. In 2010, for example, US negotiator Todd Stern declared that while the US recognises its ‘historic role in putting emissions in the atmosphere,’ it ‘categorically rejects... culpability or reparations’, echoing the first George Bush’s insistence in 1992 that ‘the American lifestyle is not up for negotiation’.

Other countries, particularly in the global South, have always expressed outrage at the US stance, which flies in the face not only of its own legal torts tradition but also of the principle of ‘differentiated responsibilities’ for climate change that the US signed up to in 1992. Yet in their day-to-day practice and policy, almost all nations, South and North, now in practice support the US disavowal of responsibility. As Herbert Docena and others show, the US accomplished this feat not by making abstract speeches at UN plenary sessions but by quietly helping to embed a far-reaching regime of concrete, specific deresponsibilising practices in the climate change mitigation institutions in which all signatories to the Kyoto Protocol participate (Docena, 2010). Again, this was almost entirely the achievement of the carbon trading gambit.

For example, as part of its market architecture, the Kyoto Protocol bestowed tradable rights in the Earth’s carbon-cycling capacity exclusively on Northern countries, proportional to how much of it they were already using; later, the European Union Emissions Trading Scheme (EU ETS) also unilaterally granted to European countries rights in this global good. The result was a system based on the principle of ‘the polluter earns’ or ‘the polluter is bribed’ rather than that of ‘the polluter pays’ (which, of course, would have had its own problems). At the same time, instead of being fined for failing to meet Kyoto’s targets (which, as Docena points out, ‘implied the commission of an offense’), industrialised countries were encouraged to buy extra pollution permits to compensate for their failure (which, again in the words of Docena, ‘connoted the acquisition of an entitlement’) (Docena, 2010: 42). In Nigeria, the Philippines, South Africa, Guyana and many other Southern countries, meanwhile, governments were incentivised by carbon markets not to promulgate or enforce environmental laws (which attribute responsibility for harm to their subjects) but instead to allow their societies to remain dirty in order to collect fees for cleaning up later; or to encourage deforestation so that they could later claim that they had ‘reduced’ it. Such forms of gaming further undermined juridical approaches to the environment.

The increasing institutionalisation of opportunity-cost estimates in the design of biotic offset schemes similarly favoured the relatively wealthy – those with the means to destroy forests wholesale rather than poorer, communities who followed a more environmentally benign approach – and thereby further reduced the space for practices that worked to recognise and gauge responsibility for either destruction or preservation (McAfee, 2012). Carbon markets worked best by taking advantage of pre-existing inequalities, which entailed giving short shrift to the rich's responsibility to right them.

Throughout the new carbon market system, participants were forced to track, manage and price the movements of commodity molecules of greenhouse gases without regard for their status as 'survival' or 'luxury' emissions. This constituted a further blow against a 'commons' view of environmental activism (see, for example, Thompson, 1990), according to which the right to subsistence takes precedence over the price system and private property, and capital accumulation is not allowed to dominate survival considerations. It also tended to undermine the juridical view according to which the rights and interests of private corporations must be balanced against those of the public. Tens of thousands of experts, traders, bankers, lawyers, accountants, consultants and bureaucrats went to work setting fuel emission proxy factors, commenting on carbon project design documents, formulating schedules and criteria for payments for forest conservation certificates, making submissions to the Clean Development Mechanism Executive Board, hedging investments, buying land, tallying molecules, balancing accounts, establishing ownership and discovering prices, each day producing a bit more deresponsibilisation in each of the offices and other arenas they worked in.

The bulk of the work of building a moral and political economy of carbon trading was carried out by institutions that positioned themselves as 'apolitical' or 'not taking a stance'. Behind their 'technical' façade, however, organisations such as the World Bank, UNCTAD and UNEP acted as *de facto* legislators, normalising the carbon market's moral theory by rolling out various kinds of trading infrastructure before obtaining any mandate to do so under the United Nations Framework Convention on Climate Change (UNFCCC) – one example being programmes to prepare REDD projects for the carbon market before the UNFCCC has approved REDD credits. The Center for International Forestry Research (CIFOR) has played a similar game. Given that 100 researchers associated with CIFOR have been working on REDD in Indonesia alone, to infer that the organisation has had no stake in seeing REDD and carbon trading normalised globally would be naïve in

the extreme. Yet according to its outgoing director, Frances Seymour, CIFOR ‘doesn’t take positions on anything,’ merely suggesting means for addressing goals which remain hypothetical until given official approval (Lang, 2012). Such disavowals are familiar features of the would-be ‘anti-politics machine’ that James Ferguson described in his book of the same name (Ferguson, 1990). In the carbon markets as elsewhere, their function has been to help promote a false dichotomy between political ‘ends’ and technical ‘means’ that, by reducing politics to the intermittent presentation of abstract ‘position statements’, allows the extensive political, neoliberally biased work of agencies such as CIFOR and the World Bank to be shunted safely into the ‘nonpolitical’ bin.

A non-political turtle?

An illustrative literary example of the ‘non-political’ deresponsibilisation made possible by carbon market mechanics – as well as the incremental bamboozlement of widening circles of patzers – is a 44-page booklet, ‘Nuestra Casa en el Universo’, produced under a cooperative programme linking Yale and McGill Universities, the Smithsonian Institution, and the Coordinadora Nacional de Pueblos Indigenas de Panama, with finance from the Blue Moon Fund (see Potvin and Ventocilla, 2011.¹ Said to be designed as an ‘educational tool on climate change and the REDD+ proposal for indigenous communities in the Latin American tropics’,² the booklet announces on its first page that it is ‘neither for nor against REDD+’ (Potvin and Ventocilla, 2011: 5).



A friendly talking turtle guides the reader through the text, giving the narrative the appearance of neutrality.

¹ The booklet’s editors are Catherine Potvin of McGill University’s Neotropical Ecology Lab and Jorge Ventocilla of the Smithsonian Tropical Research Institute..

² See <http://biology.mcgill.ca/faculty/potvin/NEL/index.html>. ‘REDD+ is a method for “reducing emissions” [sic] that involves not just combating deforestation and forest degradation, but also conservation, sustainable management of forests and enhancement of forest carbon stocks.’

This abstract disclaimer conceals the concrete pro-REDD+ gambits throughout the rest of the text, whose function is to give readers less and less space to think clearly about the central contradictions of both REDD+ and carbon trading.

In the central gambit, the booklet's narrator, a friendly talking turtle, invites readers to accept the assumption that biotic and fossil carbon are climatically equivalent.³ A further equivalence is then introduced: 'avoiding forest burning', the turtle implies, can combat climate change just as effectively as cutting industrial emissions, meaning that, molecule for molecule, the one can be substituted for the other.⁴

Elsewhere, the text does mention that critical questions have been raised about the effects of REDD+ on indigenous rights. REDD+ managers must be induced, the turtle suggests, to 'respect our territories', allow for 'free prior informed consent', respect 'indigenous styles of life and spiritual values', ensure 'real participation of the communities' and 'respect our right to produce food'. But all this is too late. The turtle has already endorsed, probably unnoticed by many readers, what amounts to the decisive step in the violation of indigenous rights: the equation stating that biotic-origin CO₂ = fossil-origin CO₂. This equation implies that, per molecule emitted, forest dwellers and industrial users of fossil fuels are equally responsible for climate change, and that indigenous peoples, in addition to dealing with all the other pressures incumbent upon them and affecting their lands, must now take on the task of providing carbon savings to the industrialised world.

A deliberate plot on the part of the authors to further policies that violate indigenous rights? Hardly likely. The institutional momentum at the stage of the game at which the booklet was written makes such attributions of individual intentions, good or bad, pretty much beside the point. The document's moves are merely a further playing-out of a position whose relevant features were determined long ago by the acceptance of carbon trading's larger gambits.

3 This is an obvious mistake, climatologically speaking, since biotic carbon belongs to an 'active', above-ground carbon pool in constant relationship with the atmosphere, whereas fossil carbon belongs to a vast below-ground pool cut off from the atmosphere for millions of years. On p. 10, an 'equivalence' between carbon dioxide and methane is also posited.

4 The equation of hypothetical 'reductions' with actual reductions is the (again, unscientific) premise underlying carbon offsets. See, for example, Lohmann (2011).

As the inappropriateness, irrelevance or marginality of attributing responsibility for global warming gradually became established in international behaviour in this way, Southern delegates to the UN and other climate forums, as well as many climate activists, found themselves situated in the old game of neocolonialist development, sometimes without quite knowing what had been done to them. De facto, rich nations were now cast as ‘climate leaders’ rather than ‘climate offenders’, climate benefactors rather than climate debtors. The old colonialist ideology, temporarily challenged by the global debate on climate change, had been rehegemonised less through the relatively inefficient and superficial means of propaganda, moral reasoning, bad science, or outright threats and bribes than through the repetition and accretion of thousands of quotidian technical practices surrounding market construction and operation.⁵ Southern outrage survived only in an attenuated, conflicted, rhetorical form.

At the climate negotiations in Bangkok in 2009, for instance, two Caribbean nation delegates were overheard in the corridor, expressing repugnance at, and discussing tactics for challenging, the continued reluctance of Northern countries to acknowledge the extent of their responsibility to undertake meaningful emissions reductions. The conversation quickly shifted, however, to ways of gaining revenue through sale of CDM carbon credits to those same countries. The senior delegate enthusiastically enjoined his colleague to explore jatropha-planting agrofuel projects in his country. ‘But,’ the junior colleague demurred, ‘what about land conflicts?’ Not a problem, his elder counselled. ‘You can easily hire experts to give economic legitimacy to biofuel conversions.’ Between the senior delegate’s firebrand rhetorical denunciations of excessive Northern emissions and his eager participation in the Northern exploitation of Southern carbon resources in order to continue or increase those emissions, there could be little question as to which would have the greater long-term practical effect.⁶

5 It is not simply that payments for environmental services, say, can ‘crowd out’ normative or collective obligations to conserve (Vatn, 2010) and thus can be counterproductive environmentally. The institutions required for such a market to work also embed a huge range of distinctive new calculating and moral practices in everyday work life: questions, surveys, forms, science, and so on. These procedures create improvised new values that tend to confuse juridical or commons decision-making processes for deciding compensation, reparations, and the relevance of numbers thereto.

6 Noting the way conflicting moral or aesthetic languages interact in another context, musicologist Susan McClary writes that, although at one level no one wants to see Carmen die at the end of the eponymous opera, ‘Bizet’s musical strategies set up almost unbearable tensions that cause the listener not only to accept Carmen’s death as inevitable but actually to desire it’ (McClary, 1991: 62).

How it was done, part III – Financialisation

Accepting the US's carbon-trading gambit had a third long-term consequence of which many patzers, with a mental architecture built partly from neoliberal nostrums and memories of the short-lived 'golden age' of capitalist development between the end of the second world war and the 1970s, also failed to take full account. By taking various poisoned bishops, the patzers had also, often unwittingly, thrown in their lot with an ongoing movement towards increased financialisation and 'supercommodification' of nature, which was inherently and structurally damaging to their own climate action cause.

Beginning in the 1970s, business has been confronted with a deep profitability crisis and a deterioration of the US-centred cycle of accumulation that has been dominant for about the last 100 years (Arrighi, 1994).⁷ In search of better returns and greater security, mobility and liquidity, capital has turned increasingly from ordinary production, services and trade to finance, which today accounts for the bulk of private sector profits in the US and other rich countries. As the financial sector and its demands and criteria have become more and more influential (unchecked by the 2008 financial crash), a strategy of 'take, don't make' has increasingly taken precedence over the protection and development of common goods, as well as investment in creativity and technology. The result has been to concentrate different kinds of power over land, water and air in financial institutions. Assets have been stripped, labour and rural communities have been robbed, and much of the generative and resilience-fostering capacity of society cannibalised. At the same time, finance has attempted, quixotically, to control contingency by mathematising and commodifying the radical uncertainty that previously had been critical for entrepreneurial activity (Ourousoff, 2010). In its quest to regain profitability, business has simultaneously been forced into a desperate hunt for new commodities – commodities that, not surprisingly, must, as soon as they are born, satisfy the imperatives laid down by the newly dominant financial sector.

It was precisely during this period that pollution trading came to prominence, nursed by such figures as Richard Sandor, a Chicago trader and economist who had earlier pioneered the interest rate derivatives that played a significant part in the financial boom. Since then, a continually revamped and expanded banking and 'shadow banking' sector has been 'reprocessing' climatic stability as well as other 'ecosystem services' as credits or information capable of flowing smoothly through global financial circuits. Indeed, Wall Street, the City of London and other

⁷ See also the papers of Jason W. Moore.



In its quest to regain profitability, business has been forced into a desperate hunt for new commodities.

nodes of finance today form partnerships with various specialist institutions in restructuring the very science by which environmentalist patzers are accustomed to swear.⁸ The result has been even more positional advantage for the chess masters in their struggle to keep fossil fuels flowing out of the ground.

By falling for the carbon trading gambit, in other words, the patzers were not only endorsing a mechanism that had been developed in the shadow of a surging financial sector, but also ensuring that climate policy – indeed, the very definition of the climate problem – would henceforth be heavily influenced by its institutional needs. Pressures from traders and speculators consistently favoured liquidity and fungibility of carbon instruments, securitisation, exchangeability and interlinkages with other commodities, as well as the expectations of high short-term return on investment that financialisation has promoted,⁹ all of which further distanced climate action from the imperative for structural change away from fossil fuels, as well as the need for an approach that addressed the North's historical responsibility for global warming. Proposals for 'green bonds' based on carbon offset and other 'ecological' collateral meanwhile foreshadowed a new chapter in the de facto shift of climate and other ecological indebtedness from North to South.

Containing challenges, reframing narratives

The three key processes of positional consolidation sketched above – the institutionalised defossilisation of the global warming problem; the institutionalised deresponsibilisation of industrialised countries; and the financialisation of climate change action – are also, to vary the metaphor, movements towards containing a severe challenge to capital as well as towards assimilating a new opportunity for its expansion. In this process of enclosure and reframing, 'inconvenient' aspects of the climate problem – for example, its roots in inequality and the exploitation of fossil fuels – are made invisible and new scapegoats invented.

8 Lohmann, 2011; Robertson, 2004; Leach et al., 2012. Merrill Lynch, for example, has partnered with Dorjee Sun, a forest carbon trading promoter, in endorsing the pseudo-climatology underpinning REDD, according to which preventing the release of biotic carbon into the atmosphere is climatically equivalent to halting the flow of underground fossil carbon into the above-ground system comprising atmosphere, oceans, biota and surface geology.

9 Members of the International Emissions Trading Association, for example, in lobbying for a more liquid carbon market with greater opportunities for intermediation and speculation, attempt to influence the characteristics of carbon commodities themselves. See, for example, International Emissions Trading Association, 'IETA response to the call for input on modalities and procedures for standardized baselines', 22 March 2010, http://cdm.unfccc.int/about/standardized_baselines/sbase_ieta.pdf, which proposes means for streamlining the production of carbon credits through more 'mechanised' procedures of commodity construction that can quickly commensurate highly diverse modes of 'carbon-saving' behaviour. Cf. Paterson (2012).

Carbon trading and other manifestations of the ‘green economy’ strive to bring what come to be seen as troublesome ‘external’ factors – in this case environmental – within what historian and sociologist Giovanni Arrighi calls the ‘economising logic of capitalist enterprise’. While the circumstances and the problem are historically unique, this is a classic dynamic of corporate interests trying to tame, commodify, and turn into a source of profit entities that have not hitherto been bought and sold. As with all such strategies, conventional analytic divides between ‘state’ and ‘market’ are seldom of much explanatory use. Just as the Dutch East India Company exercised quasi-governmental powers, and 20th-century Fordism and Keynesianism required far-reaching coordination between state and business, so too carbon and other environmental-service markets are hybrid public/private entities whose commodities are usually creations of government regulation.

These strategies involve new anti-commons moral narratives recounted in the language of orthodox mathematical economics (Lohmann, 2003; Hildyard et al., 2012). One such narrative is the dramatic script that casts those who depend on the commons as idle, non-industrious and non-deserving: capitalist crises, George Caffentzis suggests, ‘stem from refusal of work’ (Midnight Oil Collective, 1992: see also Graeber, 2011).

On the chessboard of the green economy, biologists, UNFCCC delegations, carbon accountants and bankers working in carbon markets often act as de facto legislators and moral reformers insofar as they help put together an elaborate infrastructure allowing pollution fines to be replaced with fees and legal judgements against environmental offenders with prices. Wealthy offset project sponsors like Cargill or Chubu Electric become virtuous agents creating ecological value (it is they who allow emissions that otherwise were ‘inevitable’ to be ‘avoided’), while nonprofessional actors in already low-emitting contexts or social movements actively working to reduce use of fossil fuels are cast as passive objects or even global warming culprits.

Technicians calculating how much greenhouse gas emission a hydroelectric dam ‘avoids’ act as global legislators deciding how large European entitlements to the Earth’s carbon dumps are to be. Scientists who ‘monitor, report and verify’ emissions become political agents assigning responsibility for greenhouse gas production to physical territories like ‘China’ or ‘Mexico’ instead of to the social classes and technical infrastructures that consume the goods produced in such locations. And just as environmental responsibility becomes a ‘product component’ of Starbucks coffee or monoculture plantation timber certified by the Forest Stewardship Council, obscuring underlying processes of enclosure, ecosystem services



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markets are in part a political move to contain and pre-empt the ‘environmentalism of the poor’ (Martinez-Alier, 2002) that poses such an enduring threat to business. Nowhere is this clearer, perhaps, than in the way the leftist agitation of the Brazilian rubber-tapper union leader Chico Mendes, who led a movement for community-strengthening ‘extractive reserves’ in the 1980s, has been digested and translated into support for new forms of capital accumulation. For his pains, Mendes was assassinated in 1988, but by 2012, his famous statement –

In the beginning I thought I was fighting to save the rubber trees.
Afterwards I thought I was fighting to save the Amazon rainforest.
Now I realize that I am fighting for humanity

– was festooning a brochure promoting a North American-influenced plan to convert Acre, Mendes’s home state, into an international exporter of pollution and biodiversity-destruction rights as well as many other ‘green’ products (Weiss, 2012).¹⁰ ‘Poor Chico,’ one Acre activist commented 24 years after his murder. ‘They never stop killing him.’

Such attempts to co-opt grassroots environmentalism are one aspect of the attempt of the ‘green economy’ to rewrite contemporary political ecology along colonialist and racist lines. REDD, for example, is infused with the myth that Northern industrialised societies are being victimised through Southern ‘slash and burn’, bureaucratic corruption, and lack of proper discipline and ‘governance’. The motif, while decorated with ‘technical’ talk of all kinds,¹¹ is a familiar cultural expressions of contemporary racism, in which racists are presented as victims of immigrants, the dark-skinned, and so on (just as misogynists frequently present men as victims of women). Along the same lines, REDD likes to depict indigenous forest peoples as ‘noble savages’ to be rewarded for their stewardship of nature – but only as long as they do not resist containment within REDD’s incipient provisions for property reform, monitoring, labour discipline, ‘participation’, ‘consultation’ and ‘free prior informed consent’. If they do resist, they risk being redefined as obstructionist and environmentally destructive.

¹⁰ Among the supporters of the plan are the World Bank, WWF and the Woods Hole Oceanographic Institution. Acre Law N. 2,308 – reportedly first drafted in English – was promulgated on 22 October 2010 to incentivise the ‘maintenance and expansion of supply’ of ‘ecosystem services and products’.

¹¹ See, for example, the consulting firm McKinsey’s ‘cost curves’ for REDD.

Consequences

If politics is the art of the possible, in short, the multiple mechanisms of the new green economy are having the effect of constricting political space by making effective environmental action – and even sober analysis of environmental problems – less possible. As this article has argued, carbon trading – to take the leading example of ecosystem services markets – is a culturally complex strategy favouring those types of climate action that first, do not impact on fossil fuel use; second, pre-empt juridical approaches to mitigation; and third, are subject to the imperatives of a dominant financial sector. Believing that by accepting the quid pro quo of carbon trading, they were helping keep open paths for future change that ‘fundamentalists’ with tiresomely ‘moral’ or ‘ideological’ obsessions were endangering, patzers unwittingly helped close them off, as the depoliticisation and deresponsibilisation that resulted from carbon trading consolidated the overall ‘board position’ of their opponents. Both inside and outside the UN, carbon markets helped crowd out intelligent political debate (Lohmann, 2008), putting the patzers in what chess players call *zugzwang*, in which the only moves you can make will weaken your position further. (In the instance of *zugzwang* pictured here, from a famous game played in Copenhagen in 1923, it is White’s move. Ahead in material, White nevertheless finds that all of the moves available lose the game for him.) Particularly with the launch of the EU ETS in 2005, the diversity of political resources available for constructive change dwindled.

Ahead in material, White nevertheless finds that all of the moves available lose the game for him.



The patzers never even got the passing satisfaction of having induced the US into a few nominal emissions cuts. In a supremely contemptuous gesture of cynical mastery, the US withdrew from the Kyoto Protocol three years after it had succeeded in inserting carbon trading into it, and long before the associated institutional processes had fully played out. More than a decade later, the results of those processes were on view at COP-17 in Durban. After having launched the multitude of carbon trading practices that eroded the principles of historical and ‘differentiated’ responsibilities, the US set the seal on its victory when the principle of ‘legal equivalence’ or ‘legal symmetry’ of obligations between North and South was allowed to enter discussions over the constitution of a new protocol. By the time of the Durban talks, similarly, the so-called ‘binding targets’ of yesteryear were being openly derided in favour of ‘pledge and review’ measures. While ‘new market mechanisms’ of even greater benefit to fossil-fuelled industry than the CDM were being mooted, the future appeared to be one of a ‘proliferation of low-value, nontransparent carbon markets without any binding global cap on emissions’ (Whittington, 2012: 113).

Almost from the moment the US had seen its winning gambit of 1997 accepted, the smirks had been clearly visible in Washington, the derisive, mocking chuckles almost audible.



Eric Draper



Peter Arnold

Many patzers squawked, some even resorting to the desperate expedient of trying to rejuvenate yesterday's US agenda (Kyoto) as an alternative to today's. But the damage had already been done. By the time the position that had been achieved in 1997 was played out (with great help from the EU, which had become the leading force behind carbon trading between 1998 and 2003), the rout of 2011 was little more than a formality. Almost from the moment the US had seen its winning gambit of 1997 accepted, the smirks had been clearly visible in Washington, the derisive, mocking chuckles almost audible. For those with ears to hear, the same sotto voce laughter was now rippling through Durban.

Conspiracy or pattern recognition?

For many, to see the introduction of carbon markets into the Kyoto Protocol as a prescient strategy in defence of fossil-fuelled productivism may look like an overestimation of the foresight and coordination of US elites, even to indulge in 'conspiracy theory'. Consider, first of all, where the idea of carbon markets came from. The theory of pollution markets was not the invention of scheming industrialists, but was developed over many years by serious economists such as Ronald Coase, John Dales, Thomas Crocker, Gabriela Chichilnisky, Robert Stavins and Michael Grubb before being promoted in the global warming arena by serious bureaucrats such as Peter Vis, Jos Delbeke, Timothy Wirth and Peter Zapfel, serious politicians such as Al Gore, and serious environmental organisations such as Washington's Environmental Defense Fund and National Resources Defense Council. Surely, common sense suggests, some of these individuals and organisations genuinely believed, at least at first, that carbon markets could support effective climate policy (a few of them have now expressed opposition) (Hilsenrath, 2009). Second, who could have foreseen all the ways that carbon markets would benefit fossil-fuel interests, banks and scammers while setting back the cause of a just transition to a low-carbon society? Third, who could have foreseen in 1997 that the EU, which was at first sceptical, would take up the baton of carbon trading after US politicians dropped it, saving it from obscurity and coming to account for more than 90 per cent of global demand? And fourth, why would anyone assume there was anything close to unanimity about carbon markets among US leaders at the time of Kyoto? Surely, the objection might be made, there was no hidden, flawlessly executed master plan, merely the usual mistakes, muddle, compromise, improvisation and unintended consequences that afflict everybody. The triumph for coal, oil and gas achieved by carbon trading was something that few intended and no one could have predicted. Basically, the objection goes, the US elites most concerned with preserving the rule of fossil fuels just lucked out.

The difficulty with this objection is that it is directed against a claim that has not been made. It confuses the mastery that the US displayed in Kyoto – and which a small group of US-influenced European bureaucrats and consultants were later able to transfuse into the EU leadership (Skjærseth and Wettestad, 2008; Braun, 2009) – with master planning. It confuses a proper respect for the well-developed, if imperfectly coordinated, pattern-recognition skills of experienced strategists with conspiracy theory. It confuses the undoubted sincerity of many of the original theorists of carbon trading with the opportunism of the policy-makers, businesspeople and financiers whose interests came to lie in developing the idea in ways that would reinforce fossil fuel use. To point to the strategic wisdom of the US gambit at Kyoto is not to suggest the behind-the-scenes working of malignant masterminds who achieved exactly what they wanted. Nor is it to suggest that the ranks of carbon trading's inventors and developers – or even the US delegation to Kyoto – did not contain their own patzers. Nor is it to minimise the role played by the EU's extraordinary late-1990s policy reversal. It is merely to acknowledge the underlying logic of the 1997 agreement in light of the particular conjuncture of forces, histories, institutions and interests at play. To vary the metaphor, insofar as a 'long con' was executed by a US elite (with the fortuitous later collaboration of a small EU clique) it was not one out of a Hollywood heist movie, replete with bleeping gadgets, synchronised watches and rubber masks, but one whose complex particulars were largely improvised as the play proceeded and which did indeed benefit from some lucky breaks.

Garry Kasparov
in São Paulo,
1 september 2011

Everton Amaro / SESI-SP



Even chess masters, after all, seldom have everything worked out to the last move.

Some things just happen: in chess, as in the rest of life, intricately calculated plots have only a limited role. (According to Zermelo's theorem, a hypothetically determinable optimal strategy does exist for chess, but

no one is going to find it in the foreseeable future.) Formidable calculating powers (say, nine or 10 moves ahead) may be a prerequisite for master playing, but among humans the game is not and cannot be won by calculation alone. What is decisive is informed intuition.¹² By this is meant nothing mystical, merely a power of pattern recognition born of long practical experience, a deeply ingrained sense of what pathways will be advantageous and what will not. Without EU participation, the carbon market strategy could easily have foundered; but without the inspiration of its presiding Washington geniuses, it would never have been launched at all.

'If you can't beat 'em ...': From patzer to client

One part of the institutionalisation process that has consolidated the position of the US and European masters of commodified climate politics has been the assimilation of many of their erstwhile patzer opponents into their client base – an experience that provides a further cautionary strategic lesson for the conduct of campaigns about the 'green economy'.

For at least some patzers, the process in question was without question drawn-out and difficult. You know you've been snookered when a deal you yourself helped make turns out to undermine your deepest goals and allegiances at every turn. Nobody likes the feeling; but what do you do about it? If you can't turn the clock back or start the game again, or suddenly acquire so much mastery that you can turn the game around, or turn over the board and upset the pieces, one option is to modify those goals and allegiances. If, like most of us, you are afflicted by intellectual laziness, linear thinking and isolation from the grassroots, the temptation to try to put yourself on the other side of the chessboard can become almost irresistible.

That doesn't necessarily mean adopting outright the goals of the masters who outwitted you. But it may well mean devoting a bit of time and effort to the new interactions and new obligations entailed in finding a subordinate niche for yourself and some of your needs in the strategies or 'anti-politics machines' used to achieve those goals, and securing compensation for following an etiquette of abjuring any visible opposition to them.

In the language of political science, this is known as patron-clientage. Patron-clientage is a kind of exchange premised on the maintenance

¹² The eccentric chess grandmaster Bobby Fischer, as Robert Osterbergh points out, sometimes said that he didn't know exactly why he moved a certain piece to a certain position – he merely 'felt that that the board was burning in that particular spot' and therefore he had to move there.

of inequality. Classically, powerful patrons provide protection or other benefits to lower-status clients, who reciprocate by publicly endorsing the patrons' claims to leadership and offering support, assistance, compliance, votes and the like. The underlying asymmetry in power and status is clear but accepted as legitimate, and both sides rub along together symbiotically with the aid of a panoply of rituals and symbols of deference, mutual obligation and amity.

In climate politics, what patrons such as US and EU governments and corporations provide to their client governments, client NGOs and client technical institutions often includes financial resources and political connections. But perhaps an even more important gift is respectability and a certain measure of dignity – an escape from being seen as patzers. In return, clients provide loyalty and deference. The tacit understanding is that they will abandon their former climate goals, instead providing technical and moral support for their patrons' own climate policies and projects, and refrain from threatening their patrons' power by, say, attempting alliances with popular opposition movements.

For example, client NGOs can suggest technical refinements to the CDM (turning their backs on the CDM's grassroots opponents) in exchange for a public declaration on the part of governments or corporations that they 'take seriously' a 'Gold Standard' for CDM, say. Or they can supply support for (or 'neutrality' about) REDD in return for (infeasible) promises to respect the principle of 'free prior informed consent' of affected communities. In addition, client NGOs can help expand the entourages of their patrons by seeking fresh clients among grassroots groups, and discrediting movements that refuse such associations. Together with client academics, client NGOs can also pitch in to help displace the blame for carbon trading's failures onto an ever-expanding universe of culpable 'external' institutions. By making more and more far-fetched proposals for reform of that universe, they can help keep carbon trading itself innocent and free of responsibility for the ongoing failures of climate policy.

Thus carbon trading's lack of results is often attributed to governments' unwillingness to 'accept the advice of climate scientists on global caps' or the 'irrational' reluctance of Southern countries to agree to emissions limits (Hahnel, forthcoming). Its reliance on pre-existing inequalities is presumed to be 'not its department' and its vulnerability to financial shenanigans viewed as an 'external' question that can be cleared up by the simple expedient of replacing 'private with public finance' or subjecting 'private finance to competent regulation' (ibid; see also Henderson, 2012). By the same token, REDD becomes in principle benign

as soon as it is realised that ‘all forest people have to do is avoid expulsion by global “sharpies”’ (Hahnel, forthcoming). Instead of questioning REDD on the ground that it poses a threat to indigenous territories, ‘climate justice activists and advocates for the rights and well-being of indigenous people’ should simply ‘concentrate their efforts on helping forest dwellers keep their lands’ (ibid).

I could have won the game if only the knight had been on a different square... if only I had seen the rook behind the queen... if only my opponent had fallen for my clever trick... if only she had not been a master...



It is at such points that client academics and NGOs most reveal their patzer roots, and patzer fantasy fully achieves its destiny as a structural component of clientelism. Saying that ‘All forest people have to do is avoid expulsion by global “sharpies”’ is like saying that all chess players have to do to win chess games is unilaterally to rearrange both sides’ pieces so that they can inflict a checkmate on their opponents in one move. ‘I could have won the game if only the knight had been on a different square... if only I had seen the rook behind the queen... if only my opponent had fallen for my clever trick... if only she had not been a master...’ This is the stuff of patzer post-mortems, not careful positional re-analyses aimed at learning where you went wrong in the first place. While such lazy reasoning may, at a pinch, serve as balm to the bruised egos of beaten adolescent chess novices, when used to defend carbon trading and REDD it is an emblem of acquiescence in lost land, ruined livelihoods and unchecked expansion of fossil fuel use. With its fatuous endorsement of the project of reshaping the entire political world to preserve the idealised image of a carbon market that ‘could work’, patzer logic is the ultimate gift of NGO clients and arm-chair economists to their respected patrons.

The beauty of such aspects of the patron–client system of contemporary climate politics is how well they accommodate and assimilate the edgy relationship that traditionally obtains between states or corporations on the one hand and NGOs and critical academics on the other. In the case of climate politics, part of the ‘respect’ that patrons provide clients consists precisely in putting on a public show of being ‘challenged’ by what are in fact tame recommendations or proposals that shift the onus for the failures of official policy onto ‘external’ entities. Clients are thereby allowed to ‘make a difference’. In the classic traditions of patronage, as mentioned above, dollars and jobs as well as the respectability of being associated with a ‘winning’ project may well be on offer.¹³ However, especially for those whose experience of having been patzers is still fresh in memory, it is the ‘respect’ part of the exchange that is likely to be more mesmerising.

¹³ For example, in Indonesia the indigenous network AMAN has received US\$3 million for REDD from the World Bank and Japan (http://www.chinadaily.com.cn/xinhua/2012-04-19/content_5723224.html), and Kemitran US\$4.7 million from Norway plus about US\$500,000 from CLUS and the Ford Foundation (<http://bit.ly/JYYpyQ>).

For patrons, too, much of the value of the exchange lies not in mathematically calculable gains, but in the execution of rituals symbolising and certifying power relations. Patrons particularly treasure the ‘loyalty’ part of the ‘loyal opposition’ that their clients provide. This is why they lay such emphasis on demands such as that expressed in the sentence: ‘We will not take your criticisms of X seriously if you insist on undermining the very foundation of X.’ Logically, this claim is almost unintelligible. In reality, elites tend to take most seriously precisely those critiques that are offered by open opponents of the overall approach in question, because they are usually the ones that are the most threatening. But if we rephrase the claim in terms of the rituals of patron–client exchange, then the statement makes perfect sense: ‘We will not offer you respect unless you offer us loyalty.’ This is also why client NGOs, despite appearances, are being rational when they buy into the fiction that they can have an influence on policy only by accepting their patrons’ choice of terrain, and that they can fight on that terrain and exercise ‘damage control’ only if they make ritual obeisance to the policy in question. In many official processes, NGO participation is far better interpreted in patron–client terms than as a way of attempting to achieve environmental or social goals.

We NGOs are naturals for clientelism not only insofar as we tend to depend on philanthropy, but in other senses as well. First, it is chronically unclear what status and leverage NGOs have with respect to official or corporate power – advisory? oppositional? revolutionary? nonexistent? Our links with the public or with grassroots or popular movements tend to be equally unclear or shifting. It is thus perpetually uncertain how secure our existence is, and how much we can depend on anybody for that security. Second, by general consensus NGOs are only as good as the more or less visible, immediate results they achieve; longer-term, intangible outcomes do not usually come in a form that fits into project evaluation reports. Yet even immediate results can be elusive. Where are NGOs going to get them? In the face of this uncertainty, NGOs can be as vulnerable to the temptations of clientelism as any small farmer deprived of the support of customary kin relationships or feudal ties by colonial policy or postcolonial privatisation.¹⁴ Particularly susceptible

¹⁴ As the communal land controlled by the village dwindled, as outsiders came increasingly to own land in the village, and as villagers increasingly worked for nonkin, the value of patron–client links increased for all concerned. In traditional Southeast Asia, as in feudal Europe...the inability of kindreds to provide adequate protection and security fostered the growth of patron–client structures. Both corporate kin groups and corporate village structures had depended on a certain level of economic autarchy for their vitality – an autarchy which colonial economic policy quickly eroded. These corporate structures (where they existed) tended to lose their monopoly over resources and personnel in situations where land and labor became free commodities... As a mechanism for protection or for advancement, patron–client dyads will flourish when kinship bonds alone become inadequate for these purposes’ (Scott, 1972). See also Vandergeest (1991) for a superb discussion of why the gift relationship, which overlaps with patron–clientage, ‘is not necessarily a relation which is opposed to “capitalist relations”’ (p. 439).

are patzer NGOs who – whether through bias, inexperience, ignorance or lack of political imagination – have already limited their other options by cutting themselves off from grassroots movements or by assuming that official or corporate patrons have an oligopoly on the provision of security. Characteristic expressions of the type of patron-clientage that grows out of such circumstances include ‘we have no choice but to become consultants on carbon trading because the train has already left the station’; ‘we are where we are, and the task now is to take what has been placed in legislation and try to improve its efficiency’ (Helm, 2009: 244); ‘so many millions of dollars will be available that we ought to be able to use at least some of it for our own purposes’. While there have, of course, been brief moments in the development of climate politics during the last 20 years when inexperienced or overconfident activists or experts – almost exclusively in the North – believed or hoped that they had found, in ‘science’, a source of power independent of private corporations, the state sector or mass movements, the idea that such a *deus ex machina* might offer politically weak or unimaginative NGOs a ‘non-political’ refuge from clientelism was always illusory.



Trevor Sikorski realised that ‘the carbon market and global climate change discussions are fairly remote cousins, only vaguely acquainted with each other, hardly speaking to each other really’.

Anyone who doubts the dominance of clientelism over environmental concerns among official UN delegations needs only to consider the observations of Trevor Sikorski, a Barclays Capital carbon trader, at the Durban climate talks of 2011. In his blog, Sikorski reports with a certain bemused awe how difficult it was to find UN delegates who knew the first thing about carbon prices:

I decided to see if the random COP delegate (let’s call them COPpers, for short) had any idea of the chaos reigning supreme in the carbon market. I did this by approaching unknown, to me anyway, COPpers and asking them if they could tell me roughly the current market price of CERs. I was fairly happy to be generous on the answers, so anything between €4 and €6 would get a tick and a hearty well done from me. Like I said, I was being generous. After a punishing 15 minutes of doing this, I realised that the carbon market and global climate change discussions are fairly remote cousins, only vaguely acquainted with each other, hardly speaking to each other really (Sikorski, 2011).

The ‘chaos’ and acknowledged ineffectiveness of carbon trading, similarly, has never diminished the zeal of client Washington NGOs such as Environmental Defense Fund and WWF to lobby for new carbon markets in Mexico, China, Thailand and elsewhere (Volcovici, 2012), nor checked the determination of other client networks to expand existing carbon markets in Africa (IISD, 2012), nor put a lid on the extravagance of the promises of billions of dollars of money for forest conservation

that REDD enthusiasts make to governments and community groups. It is not that the NGOs and consultants involved are idiots or have donned ideological blinders that prevent them from seeing the reality of carbon markets. It is rather that, in the eyes of such clients, the long-term environmental and economic performance of the markets is simply irrelevant to the patronage networks and other institutional arrangements that sustain them or provide their lives with meaning in the short term.¹⁵ While even the most callow of patzers may keep tabs on prices in the wistful hope that the bishop they once captured will someday turn out to have been worth it, Sikorski's observation suggests that UN delegations and client NGOs and consultants, entwined as they are in clientelistic frameworks in which such details have little meaning, don't even bother.

From the point of view of environmental effectiveness, the line between patzedom and clientelism may seem difficult to make out. The opportunities to achieve 'respect' that patrons offer their clients – the chance to formulate 'standards' and 'safeguards', to 'curb the cowboys', to 'improve governance and participation', to 'use our system for your own goals (land rights, etc.)', to engage in 'damage control' – may look to those who are concerned with long-term results like nothing more than a few extra poisoned bishops. The point, however, is that patzers become clients precisely by leaving the goal of environmental effectiveness behind. Environmentally speaking, both patzers and clients are failures – but which would you rather be? It is not only bankers and hedge and private equity fund CEOs who smile when Washington NGOs announce a campaign to institute new 'principles' and 'safeguards' at the World Bank so that it can 'lead the financial world in the right direction'. The NGOs get a nice flow of cash too. It is not only government ministers and corporate bigwigs who smile when executives of Big Green NGOs accept their invitations to lunch. The Big Green executives get a slap-up meal too – and a fetishistic sense that they are finally getting somewhere.¹⁶

Who are the ultimate patzers?

Many of us early critics of carbon trading flatter ourselves that we are neither as shortsighted as the patzers nor as blind to the power of potential grassroots alliances as the clients. Preening ourselves on our ability to see through the claim that carbon trading is an 'instrument for reducing the

¹⁵ The same is perhaps true with respect to average players in markets in complex derivatives, which swiftly reasserted their economic prominence following the financial crash, despite increased awareness of their dangers.

¹⁶ To put it in terms that Slavoj Žižek uses to describe certain kinds of fetish, the executives 'know very well' that they are not getting anywhere, '*mais quand meme ...*'; they continue to 'believe'.

cost of achieving climate goals', we criticise people who describe their work within the trading establishment as 'damage control' as having fallen into a lazy clientelism.

Smugly, we note that all the evidence about the effects of carbon trading (and carbon trading reform) is on our side. European Union carbon prices have been so low for so long, for example, that they have become an embarrassment to EU officials, who, forced to admit that the market is providing no incentives for a green transition, are putting on a belated, desperate, contradictory and doomed show of trying to overhaul it (Point Carbon, 2012; Qassim, 2012). With the Clean Development Mechanism in disrepute, ideas such as that (say) a Gold Standard for carbon credits might help redeem it now look as quaint as the idea that the current US regime might commit itself to deep emissions cuts. The notion that REDD could be used to squeeze authoritarian governments into agreeing to the principle of 'free prior informed consent' is clearly on course towards the same destiny. The moment for 'we told you so' triumphalism seems to be fast approaching.

But before gloating too much, perhaps we should take a closer look at ourselves. We find fault with the patzers and the clients for being distracted from the task of grassroots organising by the carbon market gambit. But haven't we made the same mistake, year after year mounting all sorts of sophisticated intellectual assaults on what is in many ways a mere decoy when we should have been targeting the fossil fuel interests behind it? In learning to ridicule molecule targets, have we not drained a lot of energy that could have been devoted to organising to keep oil in the soil, coal in the hole, tar sand in the land, gas under the grass? Have we not spent too much time confronting patzers and clients with logic and evidence when we could have instead been building better alliances with the popular movements who have never given much weight to their opinions anyway? By lavishing critical attention on the patzers' premise that carbon trading is structured to foster (efficient) climate action – when everybody should know that it isn't – have we not ourselves walked into a trap and wound up reinforcing the delaying and temporising functions of market environmentalism?

Perhaps before too long carbon trading will indeed collapse, and the traders who remain will be released into the streets to seek new, equally lucrative professions. But so what? Carbon markets have had a nice 20-year run, which is perhaps more than anyone had a right to expect. And during that time all the controversy over them – including a lot of the criticism – has succeeded beautifully in distracting public and official attention from the underlying issues.

Perhaps it is true that we carbon trading critics have been able to avoid the extreme political naïvety of the patzers, as well as the political unimaginativeness or *sauve qui peut* cynicism of the clients. But again, so what? From the point of view of larger social transformation, how different are we from the market proponents and reformers? We like to tell ourselves we are more ‘masterly’ than the patzers, but, given that we ourselves have spent so much time on non-issues, it has to be asked who the real masters of the game are, if not, again, the US government, the EU, dirty industries in North and South, financial firms, and so on.

Strategy and patriarchy

Our soul-searching might extend even further. Assuming that we too have been patzers, might not our most patzer-like action, paradoxically, be the very use of concepts like ‘patzer’ and ‘strategy’?

No one who uses the word ‘strategy’ can afford to be unaware of the reeking baggage it carries of warfare, exclusion, containment and top-down planning. Traditionally, such words are most at home in a masculinist environment, or at the very least in a simplified, ludic, zero-sum world

For those who concentrate on survival rather than triumph, on multiple rather than single identities, on coexistence rather than purging and containment, terms like ‘strategy’ – along with chess and warfare metaphors generally – might appear to be a symptom of something that needs to be resisted.



of winners and losers.¹⁷ In assuming everybody must strive for a superior ‘strategy’, are we not precluding the possibility of rejecting such a simplified world, or putting it in its proper place? In heaping insults on patzers, are we not implicitly conjuring up a competitive, machista vision of ourselves as their masters rather than as co-inhabitants of the same world? Are we not buying into the same myths promoting patriarchal containment that we criticise? Shouldn’t we rather try to avoid or transcend those games that encourage a drive to evolve ‘strategies’ to beat patzers? To put it another way, to what extent should we be interested in spending our lives trying (and inevitably failing) to be Garry Kasparov? Most activists are likely to feel that they have better things to do than go around pretending that some day they, too, can learn to be chess masters – miniature Machiavellis like Todd Stern, Andrew Steer, Christiana Figueres, Al Gore or Barack Obama. For those who concentrate on survival rather than triumph, on multiple rather than single identities, on coexistence rather than purging and containment, terms like ‘strategy’ – along with chess and warfare metaphors generally – might appear to be a symptom of something that needs to be resisted.

The point of highlighting the significance of strategy in climate politics, however, is not to propose that popular movements and their supporters necessarily can or should ‘master’ the same game that, during the past 15 years, patzer NGOs and diplomats have consistently lost. Quite the contrary: it is to suggest that they might better honour their nature and achieve their goals by not staking everything on political plays involving complex attempts at commodification in which big business, a few powerful states and an elite corps of technical and legal consultants are the undisputed pros. By the same token, the point of criticising clientelism among NGOs is not to say that the challenge of promoting climate justice that they face could be addressed if they somehow found a way of becoming patrons instead of clients, but rather to warn that activists genuinely seeking to achieve climate results need to be wary of the whole system of patron–client relations that has grown up around the carbon market as around so many other international policies. For movements that may be relatively weak politically at the outset, the objective of talking about strategy is not necessarily merely to follow the constricted, linear path of proposing expert methodologies for ‘winning’ what are in fact unwinnable zero-sum games, but rather to insist on a broader vision that includes the ‘metagame’ or ‘intergame’ where more political space can be found. Over the past century, many intellectuals of a liberatory

¹⁷ The poet George Oppen once noted that it always seems obvious at the time which political actions are valuable or not, although afterwards such judgements are impossible to prove; whereas with art it’s impossible to prove whether an art work is valuable at the time of its creation, yet afterwards it becomes perfectly clear whether it is or not.

bent have furthered this vision by opening up new senses of ‘strategy’ that float away from the word’s militaristic connotations. For example, Karl Polanyi speaks of a ‘double movement’ (Polanyi, 2001), Michel Foucault of ‘discursive strategies’, Ashis Nandy of ways that colonised peoples turn the coloniser into a ‘digestible bolus’ (Nandy 1983), James C. Scott of ‘oppressed groups’ development of ‘hidden transcripts’ on ‘protected sites’ (Scott, 1990), J. K. Gibson-Graham of strategies that build alternative economies (Gibson-Graham, 2006), cultural critics of ‘artistic strategies’, gender theorists of strategies of presentation, and nearly everybody of ‘strategies for survival’ used by the poor. In the case of global warming, one way of moving away from the dominant (militaristic, calculative, repressive) strategy of ‘controlling emissions’ (which inevitably rebounds on those who ‘emit least’ as well as failing to address climate change itself) towards a richer approach would be to help set in motion a more collective questioning of fossil fuel civilisation, thus working to connect movements concerned with extraction, pollution, globalisation, exploitation of labour and much else besides.

To broaden the meaning of ‘strategy’ in this way is not to suggest that there are no ways popular movements can also use or reclaim its more restrictive senses. Market logics, for example, are constantly used by all sides in nearly all struggles; few critics of market environmentalism can be accused of being ‘against markets’ or of being ‘ideological purists’, although their opponents typically love (for ‘strategic’ reasons) to try to put them in this box.^{18 19} Moreover, even those practices most narrowly associated with competition, warfare or profit – assuming that they are of interest as power matrices at all – can be seen as internally constituted by various edifying conversations or dances, not simply instrumental

18 ‘In a meeting in Dar es Salaam in 2004, a UNDP official asked me if I was “against markets”. We were discussing the prospects of the country’s new land law for safeguarding local land rights in the light of the current policy environment to promote private investment by setting up a national land bank for foreign investors. The request that I declare whether I was “for them” or “against them” seemed quite strange, given that we were talking about a variety of forces influencing the new law’s implications for rural livelihoods and development. This question was not only problematic for the false choice that it posed, but also for presenting a development narrative in which that choice was even imaginable. For many Africans, rejecting all markets is not plausible or desirable, no more than blindly embracing widespread and deepening market relations as a solution for poverty, insecurity and rights’ (Gardner, 2012).

19 In a parallel from musical politics, McClary analyses the way a Madonna song ‘sets up residence on the moments of the harmonic context that fluctuate’ between a ‘masculine’ single resolution and a more ‘feminine’ region of desire and freedom: ‘[T]o the extent that identification with the feminine moment in the narrative spells death, the piece cannot embrace this reality without losing strategic control. Thus the singer risks resisting identification with ‘her own’ area, even if it means repeated encounters with that which would contain her... Rather than deciding for the sake of secure identity (a move that would lapse back into the narrative of masculine subjectivity), she inhabits both and thus refuses closure’ (McClary, 1991: 160).

activities for control freaks. In *After Virtue*, Alasdair MacIntyre famously chose chess as an example of what he calls a ‘practice’ or ‘coherent and complex form of socially established cooperative activity through which goods internal to that type of activity’ can be furthered and ‘human powers to achieve excellence, and human conceptions of the ends and goods involved, are systematically extended.’

Thus chess analysts tend to focus not on winners, losers or prize money, but rather on what they rather poetically call ‘the truth of a position’. Instead of abandoning the metaphor of chess, it might be fruitful to look at it more deeply and, rather than assuming that the game must be seen as an instrumental ‘black box’ for external ends, identify the range of practices other than warfare with which it is cognate.

Conclusion



Maybe not so many of us can be chess masters. Maybe not so many of us want to be.

Maybe not so many of us can be chess masters. Maybe not so many of us want to be. Nevertheless, there is something important to be learned from the shame of the patzers – which is all our shame – especially now that the pieces are being set up for new chess games called the ‘green economy’ and ‘climate finance’.

First, amateurs though we may always be at political strategy, the time may have come to devote more effort to understanding the rhythms of ‘long games’ – including the game involving carbon trading that began before Kyoto, or the ‘green economy’ game whose opening moves are being played today. The purpose is not necessarily to learn to outscheme the masters at their own chosen profession, nor to assign any particular prestige to it. But we need to understand their game and its context well enough to know whether and when to play it, always keeping in mind the centrality of painstaking movement-building. Only by acquiring a proper respect for its intricacies and dangers can we forestall a misplaced confidence that we can navigate its formalities as well as or better than they can. That need not entail becoming a calculating fiend, but it may well mean trying to learn to think at least two or three moves ahead rather than just one (always keeping in mind the old adage about being careful what you wish for); and working to acquire, through broad experience and historical study, at least some of the pattern-recognition skills required for better foresight. This may involve not just closer attention to struggles at the grassroots but also comparative study of the whole range of market environmentalisms and the contradictions involved in their construction, as well as historical investigation of accumulation cycles and the convulsions of finance over the past 500 years (see, for example, Lohmann, forthcoming).

This carefulness may help instil, second, a greater awareness that the structure of expertise and leadership that shapes official policy in all countries on matters involving fossil fuels will always be characterised by a bottomless indifference and cynicism. This is not a remark about personalities – indeed, to read it that way would be once again to slip into patzterdom – but about institutions and their interests and privileges and about capital and its logic. No one should waste time trying to ‘reprogramme’ the institutions in question with purely rational argument or make alliances where no alliances are possible. Climate change and other global crises are not ozone-type problems that can be solved by governments, corporations, banks or a UN protocol. The movement-building of tomorrow needs to be understood as clearly as the patzers’ failures of yesterday.

Third, Northern environmental activists in particular need to learn to trust more the political judgement that more oppressed groups have learned through hard experience, rather than the flashy, brainlessly self-confident, neoclassical culture of official Washington, London and Brussels meeting rooms or the lazy, superficial, tactical theories prevalent among even some of the most well-intentioned professionalised NGOs and academics. As the carbon trading experience has shown, underestimation of the political intelligence of the radical grassroots, particularly in the South, both goes deep and bears a high cost. Programmes of mutual learning regarding new threats, new legal infrastructure, new technostructures of complex trickery and fraud, financialisation’s weak points, and ways of breaking NGO patron-client chains are all essential, as is greater solidarity among the whole range of struggles for the commons. As the future unfolds, it will be increasingly necessary, if never easy, to look beyond the enticing poisoned pawns and bishops to see where the real games lie, in the playing of which so many millions will live or die.²⁰



kris krüg

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Civil society strategies and the Stockholm syndrome

Pat[zer] Mooney

Larry Lohmann's 'Beyond Patzers and Clients' in this volume is brilliantly provocative and – in my opinion – entirely accurate. Larry's piece is especially relevant now that we are on the other side of the tragic trilogy of climate change conferences (Copenhagen, Cancun and Durban) and the rueful Rio+20 conference on sustainable development last June. I'm left only to add some anecdotes.



Seeing UN negotiations as a game of chess with masters and 'patzers' is illuminating. The question then is, who is the biggest 'patzer'?

Seeing UN negotiations as a game of chess with masters and 'patzers' is illuminating. Larry challenges us to identify who the patzers are: the naïve civil society organisations (CSOs) thinking they could pull ahead on the carbon emissions scorecard by accepting carbon trading as part of the Kyoto deal? Those of us who have expended energy challenging false solutions in UN fora, when we could have been resisting the causes of climate change on the ground? Larry's analysis leads me to reflect on my own organisation's choices in trying to bring societal change. Having spent my life as an activist within a civil society organisation, working both in UN corridors and in collaboration with social movements on the ground, I am firmly convinced that substantial change and real solutions to our most pressing problems – food, fuel and climate – will not originate from governments (or from UN agencies), but from civil society/social movements. Institutions will never move far enough or fast enough without the political pressure from demands by peoples and social movements. So what are sensible and responsible strategies for an organisation like mine? When are we patzers and when are we agents for real change?

I stayed away from the 1972 Stockholm UN Conference on the Human Environment, believing that the problem of ecological mismanagement was secondary to the greater problem of injustice. Twenty years later, at the first Rio Earth Summit, ETC Group, the organisation I had been working with since the late 1970s (then named RAFI) saw no point in attending either, and even argued that the proposed Convention on Biological Diversity could end up institutionalising (and legalising) 'biopiracy'. We were no more optimistic about the prospects for the

World Summit on Sustainable Development (WSSD) in Johannesburg 10 years later (Rio+10), but this time we participated – not to engage with governments, but to talk to civil society partners and social movements. We saw an opportunity to reach a large and mixed set of actors to discuss the growing threats from a round of ‘silver bullet’ technologies being proposed to address our social-environmental problems.



Civil society had, to a considerable degree, become camp-followers to UN environment and development jamborees waving banners on the margins, but simultaneously legitimising largely inadequate or even dismal agendas where few real problems were being tackled.

En route to Johannesburg, we warned our allies about the ‘Stockholm Syndrome’ – a kind of psychological dependency that, back in 1973, had led clerks in a bank in Sweden’s capital city to ‘fall in love’ with their bank-robber captors after being held hostage for six days. We insisted that CSOs had been vulnerable to the Stockholm Syndrome even at the 1972 Stockholm Conference and that the vulnerability had only escalated in the subsequent three decades of major UN conferences. Civil society had, to a considerable degree, become camp-followers to UN environment and development jamborees – in essence, the ‘clients’ Larry describes – waving banners on the margins, but simultaneously legitimising largely inadequate or even dismal agendas where few real problems were being tackled. If the UN threw a party and CSOs didn’t come, there would be no party, we argued. Our absence would be felt more profoundly and have more impact than our presence.

‘Stopping the Stockholm Syndrome’¹ by calling for a CSO boycott of the WSSD was more rhetorical device than practical strategy. We knew how many CSOs had already RSVP’d, and their funders, in large part, expected them to be there. In addition, there was a small number of organisations immersed in the policy processes, trying to influence decisions usefully and effectively, or simply to execute ‘damage control’. But the point we were trying to make – that CSOs should stop being complacent and complicit – was, and still is, relevant. In ETC Group, we have found ourselves swinging from engagement with those outside the official negotiations in order to mobilise action on fundamental issues (such as terminator technologies) to lobbying those inside the process to make small, but concrete policy interventions. We know we’re not immune to the Stockholm Syndrome; we have felt the risk of slipping into a patzer/client role, to use Larry’s terms.

Two years before the Rio+20 summit in 2012, we concluded that geopolitics dictated nothing Earth-shattering would come out of the conference. But ETC Group went anyway. Governments, we thought, had found themselves on board an unstoppable train headed for Rio, compelled by the niceties of a ‘+20 Summit’. Most of them, however,

¹ See also the article ‘Stop the ‘Stockholm Syndrome’!: Lessons learned from 30 years of UN summits’ in the What Next Volume I. (Mooney, 2006). http://www.whatnext.org/Publications/Volume_1/Volume_1_main.html

clearly didn't want to be on the train; they couldn't get off and they knew they would need to produce some kind of outcome – for most of them, the less consequential the better – in order to avoid an obvious and embarrassing wreck. If civil society organisations could come up with a short, realistic and strategically useful list of initiatives, we reckoned, the G77 and the EU might be influenced, or even attracted, into taking some of them on board. We decided it was worthwhile to go for the proverbial 'low-hanging fruit' – initiatives that cost little or nothing; proposals with plausible precedents; restructuring that might slip below the right-wing radar. Rather than asking for lofty (but in the end empty) financial commitments or seismic institutional shifts, we focused on a small number of what we considered concrete, useful and achievable gains – no trumpets or treaties.

As anticipated, Rio+20 was an abject failure in effectively addressing the crises of climate, environment and development. We didn't get much either, but what we got – pieces of text here and there – provides us with clear political targets and spaces to manoeuvre.

One of the gains relates to the global governance system itself. With the three most recent climate change conferences in mind – specifically, their steady erosion of transparency and inclusiveness – explicit support at Rio+20 for the newly restructured UN Committee on World Food Security (CFS, established in 1974) as the central policy-making body on global food and agricultural issues was indeed welcome.²

In light of Larry's article, this may be an issue of considerable relevance. What does it take to set up a governance structure at the global level, which allows progressive civil society organisations and, even more importantly, genuine, broad-based social movements to participate effectively in the decision-making process without getting hoodwinked into patzer blundering or Stockholm syndrome victimisation?

In the midst of a food crisis and as a result of civil society's considerable engagement, the CFS was restructured in 2009 to allow civil society, peasant, indigenous peoples' and farmers' organisations to participate in negotiations effectively rather than nominally. In particular, the creation of the self-organised 'Civil Society Mechanism' makes it possible for

2 Our reference point in the Rio+20 outcome document, 'The Future We Want', is paragraph 115: 'We reaffirm the important work and inclusive nature of the Committee on World Food Security (CFS), including through its role in facilitating country-initiated assessments on sustainable food production and food security, and we encourage countries to give due consideration to implementing the CFS Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security. We take note of the on-going discussions on responsible agricultural investment in the framework of the CFS, as well as the Principles for Responsible Agricultural Investment (PRAI).'

CSOs to identify key spokespersons on each CFS agenda item under rules that now let CSOs intervene with much the same flexibility as governments. Most notably, the Civil Society Mechanism has yielded priority to the participation of small-scale producers. The CFS is bolstered by a relatively independent High-Level Panel of Experts (HLPE) capable of initiating studies on controversial topics (land grabs, commodity speculation and climate change, for starters) that are then discussed by the CFS.

The CFS process isn't perfect – control of its Secretariat and budget remains too closely tied to the Food and Agriculture Organization (FAO) and some of its HLPE reports have got higher marks than others, for example – but its high level of debate and inclusivity provides a model for other UN bodies and, indeed, the CFS model is under active consideration in other UN fora. Nonetheless, in multilateral diplomacy, every opening is also a target, and the future of the CFS – and any bodies made in its image – must be monitored carefully.

Another achievement at Rio+20 was the adoption by governments of language calling for a global-to-national technology facility that would include assessment – and an explicit acknowledgment that some new technologies could prove dangerous.³ (Given the active participation of the US delegation and the heavy emphasis, generally, on technologies and technology transfer as solutions, this was a surprise in itself.) The commitment to technology assessment was the result of civil society organisations taking on an important issue, where vested and commercial interests had not yet consolidated, and bringing it forward, framed in a way that made governments listen (and, in the case of a few key governments, to take leadership to help advance it). The existing policy void made it possible get a critical mass relatively quickly, making it difficult for any single country to take a countering position.

Of course, we know that any UN technology facility will never fully meet the needs of the people, and Larry's admonition – 'You know

3 From the Rio+20 outcome document (para 273): 'We request relevant UN agencies to identify options for a facilitation mechanism that promotes the development, transfer and dissemination of clean and environmentally sound technologies by, inter alia, assessing technology needs of developing countries, options to address them and capacity building. We request the UN Secretary General, on the basis of the options identified and taking into account existing models, to make recommendations regarding the facilitation mechanism to the 67th Session of the UN General Assembly.' (Para 275): We recognize the importance of strengthening international, regional and national capacities in research and technology assessment, especially in view of the rapid development and possible deployment of new technologies that may also have unintended negative impacts, in particular on biodiversity and health, or other unforeseen consequences.

you've been snookered when a deal you yourself helped make turns out to undermine your deepest goals and allegiances at every turn' – still rings in my ear (a less articulate version of it has been ringing in my ears for four decades). We know that active participation in UN meetings could become a civil society sinkhole sucking up people and resources needed elsewhere. However, en route to a technology facility, we think it's possible to create a relatively transparent forum for technology debate that also parallels peoples-based 'Technology Observation Platforms' (TOPs), established at local and regional levels to provide independent analysis of new technologies, which the UN will find difficult to ignore. Rather than falling prey to the Stockholm Syndrome, we would like to see the UN facility kept relevant and dynamic because it must continuously justify its actions and relate to other parallel, independent initiatives where civil society is fully in control.

Finally, Larry's evocative analysis brought to mind the years of FAO negotiations that eventually resulted in the International Treaty on Plant Genetic Resources for Food and Agriculture – aiming to keep the world's most important food crops essential for food security from being privatised. At the close of the first session of its governing body in 2006, civil society organisations brought forward a set of recommendations – calling for, in particular, greater participation from civil society and the setting-up of transparent monitoring mechanisms in relation to compliance with the Treaty. Then we presented an award to honour outstanding service.⁴ The prize? A 'Genetic Resources Chess Game'. Rather than the usual figurines, each chess piece represented a food crop that plays a crucial role in feeding the world's people. The game had its own set of rules, which were presented along with the set. The first rule was meant to underline how costly – when we're talking about issues of global concern, like food – 'patzer' moves can be: The game can only be won if all the pieces remain on the board.

Those of us who skirmish around the edges of the United Nations must be consistently challenged and made accountable, and we have to know that our 'gains' can easily turn out to be losses. We believe the most important work towards necessary and transformational societal change will be done in webs of social movements, but we also believe that CSOs – fragile but agile – have roles to play, if they play them well. The moral? We must always wonder whether, each time, we are the patzers or the patrons.

4 The first Herman Warsh Award for 'services to the genetic resources community' was given to Pepe Esquinas, then-Secretary to the Commission on Genetic Resources for Food and Agriculture and principal architect of the Seed Treaty.

Leaving the oil in the soil – Communities connecting to resist oil extraction and climate change

Nnimmo Bassey

Resistance is advocacy for positive, participatory and inclusive change. The barefaced rape of Africa requires continued resistance in forms appropriate to each circumstance. Without resistance, Africa will stay in the pot, like the proverbial frog in the pan, barely noticing the rising heat among so many other survival considerations, until she is cooked in the cauldron.

The web of resistance building across the continent suggests that the strongest thread will be the deliberate struggle for democratic accountability.

This call is for all citizens of the world. It does not matter how minute or benign the injustices around us may be, every objective situation demands that we mobilise forces, resist those injustices and collectively work and bring about the much-needed transformation.

Experience in the field shows that resistance to destructive extraction has to be built one block at a time. When all blocks link together, a wall forms – sometimes protecting a whole nation – to block the tide of rapacious exploitation.

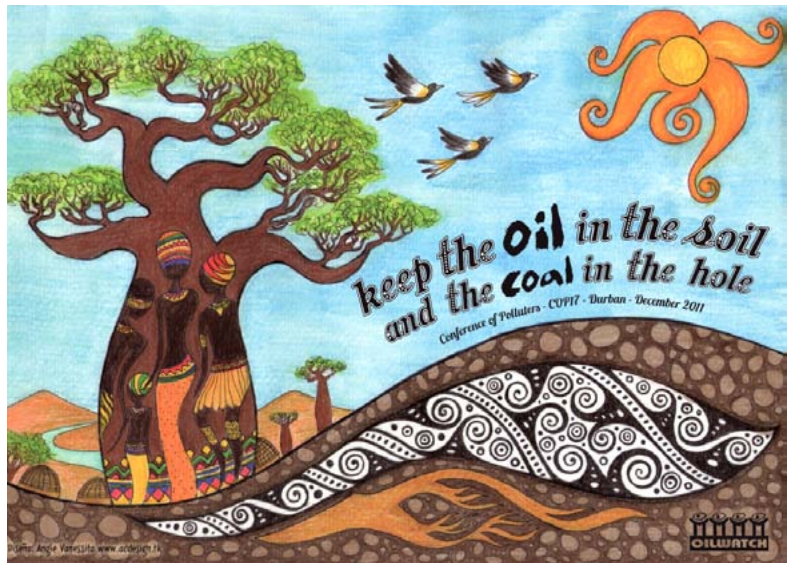
International mobilisation to leave the oil in the soil

One of the key struggles in relation to both climate change and community rights is that against the extractive, fossil industry. This powerful, profitable industry may seem invincible, but is at the heart of the problem and must be effectively challenged, just as slavery once constituted the core of colonial economies, but over decades of principled and increasingly pervasive social struggle was eventually turned into a relic of the past. Civil society groups are now organising and building movements across continents.

This article draws on Nnimmo Bassey's book *To cook a continent: Destructive Extraction and the Climate Crisis in Africa* (2012).

One of the major civil society responses to the cooking of the planet was the 1996 founding of Oilwatch International, a South–South network. It took its first steps in Quito, Ecuador and spread its wings across the world, and includes groups mainly in the South, but some in the global North as well. The signal difference that Oilwatch made was that it gave voice and solidarity to community organisations desperately trying to defend their environments. Through the work of Oilwatch, communities and groups join each other’s campaigns, exchange critical information, express solidarity and build further on each other’s successes. Although pragmatic in its demands, Oilwatch remains resolute against destructive fossil–fuel extraction.

'Keep the Oil in the Soil and the Coal in the Hole' - Design by Angie Vanessa Cárdenas for Oilwatch.



Oilwatch was incubated in the offices of Acción Ecológica, an organisation of activists passionate about the health of the Ecuadorian environment, objecting deeply to the environmental pollution in the Ecuadorian Oriente and ready to work with communities to demand change.

An early example of Oilwatch’s activism is the case of Yasuni ITT, pioneered by Accion Ecologica. Ecuador’s forests sit above extensive, yet un plundered oil reserves, with the Yasuni National Park being one of the most biodiverse spots on our planet. Oilwatch deepened the campaign to ‘Keep the Oil in the Soil’ in order to preserve Yasuni and resist oil exploitation. Ecuador is now asking the international community to compensate the country in exchange for keeping the oil below ground. As Ivonne Yáñez of Accion Ecologica explains:

Our economy depends on oil income. So we say, OK, let's create a solidarity fund with the industrialised countries giving money to this fund. This is why Germany offered \$50 million per year for thirty years, and other countries such as Italy and Spain have also made offers... We have been promoting, since the beginning, a moratorium on oil activities. This is the same: a moratorium, keeping oil in the soil, and declaring people and territories free of oil. We want to have nations emancipated from the dependence on oil and other fossil fuels. We have been growing up, and we have evolved this new concept of a post-oil civilization: Keeping the Oil in the Soil, the Coal in the Hole, the Tar Sands in the Land. (Goodman interview, 2009)

Inspiring struggles for environmental justice pop up in many parts of the world and there is an urgent need to weave these together into a global force.



tarsandsaction

The Keystone XL struggle shows that peoples' protests matter. Although the case is far from settled, President Obama eventually felt obliged to cave in to the pressure from below.

These kinds of calls to action will get stronger and wider. Inspiring struggles for environmental justice pop up in many parts of the world and there is an urgent need to weave these together into a global force to liberate Mother Earth from the claws of miners and speculators.

Take also the example of the August/September 2011 protests at the gates of the White House in the US against a proposed tar sand pipeline to link the diggings in Canada to refineries in the US. The proposed Keystone XL pipeline is designed to transport 700,000 barrels of crude oil per day to delivery points in Oklahoma and southeastern Texas. The 36-inch pipeline would consist of about 327 miles of pipeline in Canada and 1,384 miles in the US.¹

These protests quickly echoed around the world as activists joined in solidarity in Brazil, Egypt, Germany, India, Peru and South Africa. The internationalist nature of environmental justice protests points the way to redirecting power relations in a world with values skewed against nature and against the less powerful.

Protesters are concerned about the catastrophic impacts of tar sands on the climate as well as the impacts of the pipeline and related toxic substances on water resources and wildlife. There have been reports of a rise of rare cancers among First Nation peoples of Canada who live close to the tar sands fields. According to Tom Goldtooth, executive director of the Indigenous Environmental Network:

Our Indigenous-Native Nations of the U.S. and Canada must unite to oppose the Keystone XL pipeline and come together to find local, clean, renewable energy to reduce our carbon footprint and spur the

¹ See <http://www.thinkglobalgreen.org/keystone.html>

economy. There are too many major safety, environmental and public health hazards possible in the Keystone XL Pipeline project. The cost and risks of building an oil pipeline across our traditional homelands with important aquifers, waterways, natural lands and wetlands is too great at this time. Our homelands within the planned corridor of this pipeline have many cultural and historically significant areas that have not thoroughly been assessed and are in danger of being destroyed. The negative and very destructive human rights impacts of the Keystone XL pipeline transporting dirty oil from the tar sands region of northern Canada have not adequately been assessed in the final EIS [Environmental Impact Statement]. First Nations in the tar sands region have consistently been making reports of devastation of their environment, their waters, air, and more recently their health.²

The Keystone XL struggle shows that peoples' protests matter. Although the case is far from settled, President Obama eventually felt obliged to cave in to the pressure from below.

Legal challenges have also been a tool in communities' fights to reclaim their land, air, water. A case against Texaco was first brought before a New York court in 1993, and was later moved to Ecuador after successful pressuring by Chevron, which had bought Texaco in 2001 and so inherited its liabilities. Justice was finally announced in 2011: an US\$8.6 billion fine was imposed on Chevron for heavily polluting the Ecuadorian Amazon through serial oil spills between 1964 and 1990. That fine doubled after Chevron failed to apologise to the impacted peoples as required by the judgement and to pay 'moral reparations' to the Ecuadorian government.

Chevron Texaco also stands accused of atrocious violations of human rights in the Ilaje communities of the Niger Delta. In one incident, on 28 May 1998 at Parabe oil platform, a group of unarmed youths carrying out a peaceful protest experienced summary execution, torture and want destruction of their property. Chevron's assaults on them involved the use of Nigerian military aboard helicopters provided by the company. The case unfolded in the US District Court in San Francisco, and took eight and a half years to come to trial, which lasted four weeks. Astoundingly, the jury ruled against the plaintiffs in *Boweto et al. v. Chevron*, but the context certainly highlighted the blatant and pervasive socioeconomic, ecological and political injustices in this area.³

2 <http://www.ienearth.org/stop-keystone-xl/index.html>

3 Order Denying Bill of Costs. Judge Susan Illston. Case 3:99-cv-02506-SI Document 2315 File 04/22/2009. (*Larry Bowoto v. Chevron Corporation et al.* at the United States District Court, Northern District of California).

Struggles against oil extraction in Africa

One of the worst gas flares in the Niger Delta is at a former Shell facility at Oben on the border of Delta and Edo states. These have been roaring and crackling non-stop for over 20 years, since Shell first lit them. The flared gas comes from the crude oil extracted from the oilwells in the Oben field. Just as at more than 200 other flow stations across the Niger Delta, these gas flares belch toxic elements into the atmosphere, poisoning the environment and the people.

Gas flares the Niger Delta have been roaring and crackling non-stop for over 20 years, since Shell first lit them.



Elaine Gilligan

The number and regularity of oil spills make a mockery of claims of adherence to acceptable standards by any of the corporations operating in the Niger Delta. Although oil spill records differ, depending on the source, all of them show that the volumes of toxins released into the environment are incredibly high. And renowned Nigerian environmental law professor Margaret Okorududu-Fubara (1998: 815) has estimated that between 1976 and 1990 there were a total of 2,800 spill incidents, as a result of which 2,104,993 barrels of crude oil were spilled into the Niger Delta.

The Delta region of Nigeria is reputed to be one of the most polluted places on Earth. A UNEP report commissioned by the government of Nigeria to assess the environment of Ogoniland was finally made available in August 2011 after taking 14 months to complete. Among the key findings are:

In at least 10 Ogoni communities where drinking water is contaminated with high levels of hydrocarbons, public health is seriously threatened. . . In one community, at Nisisioken Ogale, in western Ogoniland, families are drinking water from wells that are contaminated with benzene – a known carcinogen – at levels over 900 times above World Health Or-

ganisation guidelines. The site is close to a Nigerian National Petroleum pipeline. UNEP scientists found an 8cm layer of refined oil floating on the groundwater that serves the wells. This was reportedly linked to an oil spill which occurred more than 6 years ago. (UNEP, 2011)

After reading the UNEP report, in the knowledge that oil exploitation was halted in Ogoniland in 1993, it is easy to conclude that other communities in the Niger Delta are as badly damaged, if not more so, given that new pollution events are still occurring.

The apogee of non-violent organising in Nigeria was the Ogoni struggle championed by the Movement for the Survival of the Ogoni People (MOSOP), which first organised in August 1990. Under the charismatic leadership of Ken Saro-Wiwa, MOSOP became an Ogoni mass movement and galvanised support from both within and beyond Nigeria. The movement also had active youth, women and student wings. It was a force that could not be ignored.

By 1993, the Ogoni people had excluded Shell from their land. The November 1995 hanging of Ken Saro-Wiwa, after a kangaroo court handed down a death sentence on trumped-up charges of involvement in the murder of four Ogoni leaders, intensified the resolve of the Ogoni people, and they have prevented Shell from returning to this land and extracting the oil the company so coveted.



If Shell is right in asserting that no other oil company in Nigeria has a better social, environmental and other record, then no oil company should be allowed to operate in the Delta.

If Shell is right in asserting that no other oil company in Nigeria has a better social, environmental and other record, then no oil company should be allowed to operate in the Delta. The Ogoni have a strong case for insisting that their oil must be left underground, as civil society groups, including the recently formed Ogoni Civil Society Platform and the Ogoni Solidarity Forum, demand.

Other civil society groups have come forward with variations on this demand. Environmental Rights Action/Friends of the Earth Nigeria (ERA) has made a proposal on how to leave Nigerian oil in the soil without causing an upheaval for the national treasury. The organisation further suggests that this proposal can be replicated for any African country and can be adjusted to suit local realities.

By keeping new oil in the soil, ERA suggests, Nigeria would keep the equivalent volume of greenhouse gases out of the atmosphere. This would be a direct measure to curb global warming through the infallible technique of carbon sequestration. No technology transfer would be required, nor would any international treaty or partnership. According to ERA, were

Nigeria to trade that amount of carbon using any of the available market mechanisms for tackling climate change, such as the so-called Clean Development Mechanism, the country might earn income from keeping the oil underground. However, ERA does not support the use of market mechanisms for such purposes. Rather, it suggests that the curtailing of crude oil theft and massive capital flight from Nigeria would boost the economy and offset the 'loss' of projected revenue from crude. The proposal also includes a domestic crude oil tax or solidarity fund into which each Nigerian would pay according to ability (an average US\$156 per year has been estimated to suffice) (Bassey, 2012:126). A climate debt paid by the industrialised world to those areas hardest hit by climate change would be another crucial strategy to ensure that areas like the Niger Delta are cleaned up at the expense of those who have benefited from its resources.

There is a strong logic for leaving the oil in the soil:

- » Retain carbon in the soil, thereby tackling climate change
- » No oilspills and gas flares from new oilfields
- » No destruction of communities or ocean environments
- » No socioeconomic ills related to oilfield activities
- » Ending corrupt oil block allocations
- » Ending Illegal bunkering and other forms of oil theft
- » Safe and clean environment
- » Reduction and ultimately elimination of violent conflicts in the oilfields.

The proposal holds that the best way forward for Africa is to halt new oil-field development and to leave the oil underground. This is because Africa cannot afford to remain in the trap of supplying raw materials at externally determined prices and with the environmental costs left unattended.

Decades of oil extraction in Nigeria have translated into billions of dollars that have brought nothing but misery to the masses. The country serves as a model to be avoided and it is time for Africa to step back and review the situation into which she has been plunged. The preservation of the environment, restoration of polluted streams and lands and recovery of the peoples' dignity will only be achieved when citizens resist the pull of the barrel of crude and understand that the soil is more important to our people than oil and its spoils.

Africa's voices are calling for change

The debates on and steps to tackle global warming must shift to confronting the root causes of the crises. This demands a deep reappraisal of the socio-economic relations that have given birth to these crises. It is necessary for humanity to rediscover that it is part of a cosmos and cannot be bigger than the whole. The current mode of production, driven by fossil fuels and other extractive activities, cannot be sustained. Corporate interests are driving our finite planet towards a cataclysm. When and why did humanity surrender its right to live sensibly and accept instead the corporate creed of greed? What can be done to restore some semblance of balance?

With so much disenchantment with government and transnational corporations, the people must forge alliances among themselves and with their communities. Solidarity must be rebuilt and people's sovereignty reclaimed in all spheres of endeavour. African governments are unwilling or unable to regulate the extractive industries. Instead, these industries hide behind instruments of state repression and enjoy impunity. Communities are criminalised when they protest against despoliation.

The answer lies in linking communities and peoples, sharing ideas through creative means of communication, learning from events and from history, and being prepared to confront the wielders of power. That is the way to reclaim our heavily polluted and overrun community environments. We must also set up community schools on sustainability and environmental justice. Experiences must be documented and knowledge and wisdom shared. We must get involved in political processes and insist that leaders are chosen through the ballot and not by the bullet.

From Dakar to Mogadishu and from Cape Town to Cairo, the peoples of the continent are slowly but surely recovering their voices. Do not mistake the stamping, singing and jumping for a dance party. These actions are the generators that power the dynamos and carve out the path of resistance and change.

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Riding the wave – How Transition Towns are changing the world and having fun

Teresa Anderson

What happened when a small town in rural England decided that it couldn't rely on the government or the United Nations to address climate change? What happened when hundreds of townsfolk realised that they could pull together to build their own resilience to the climate and economic challenges ahead?

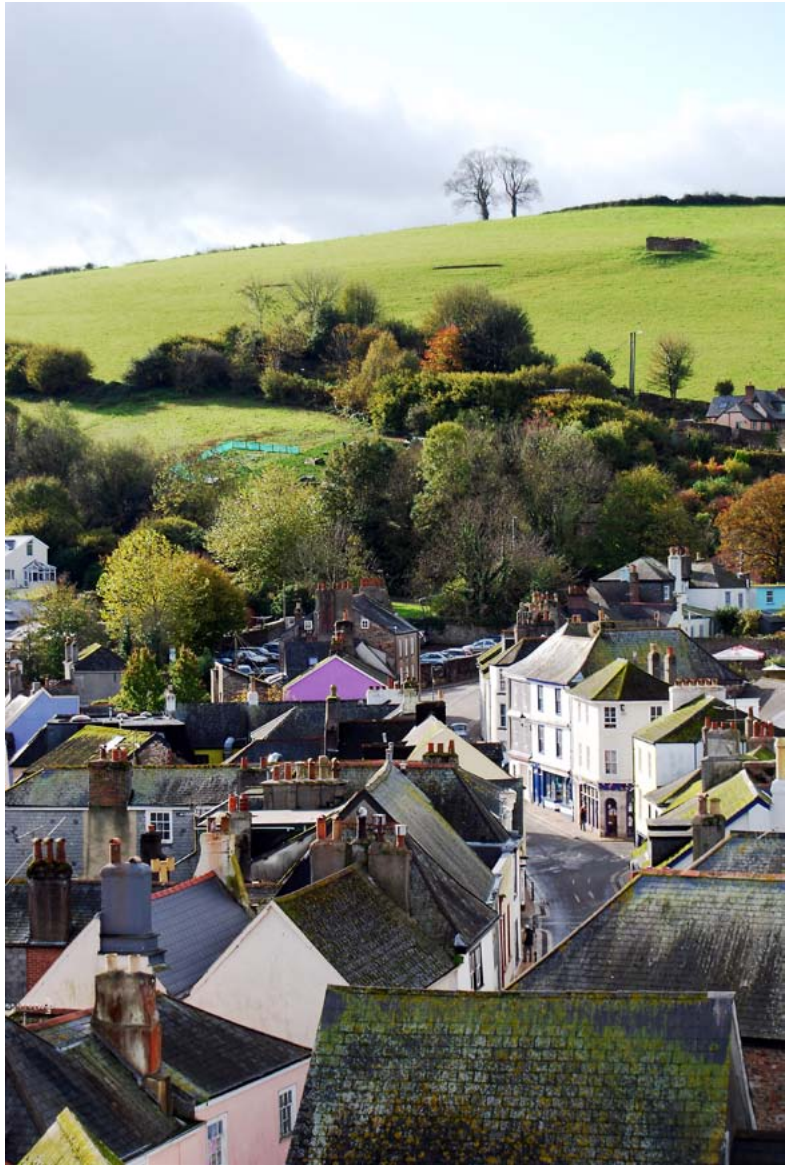
The Transition Town movement has been heralded as one of the most important social movements of our time. Its success is based on the recognition that there is energy, vision and passion in every one of us, and that with the right framework we can harness our combined efforts to create the future we want in our own homes and towns.

Five years ago when Totnes, a small market town of 7,000 people in the picturesque southwest of England, became the first Transition Town, many of us hoped it would become a useful model for others to follow. But not many foresaw that there would come to be over 1,000 Transition towns, villages, boroughs, islands, peninsulas, initiatives and projects in the UK, and 1,000 more across Europe, North, Central and South America, Asia, Africa, Australia and New Zealand today.

Transition is clearly an idea that has come at the right time; that speaks to all types of people; and that shows no sign of slowing. As the window for meaningful action in the UN climate negotiations gets smaller; as nations retreat into selfish and suicidal obstinacy, offering only commodification and blame; the importance of the Transition Town movement is more apparent than ever.

For many activists, frustrated and burned out by their efforts to limit ecological damage and the general failure to achieve positive policies, the Transition philosophy and approach has been a revelation, a joy. As Rob Hopkins, the founder of Transition points out:

Five years ago when Totnes, a small market town of 7,000 people in the picturesque southwest of England, became the first Transition Town, many of us hoped it would become a useful model for others to follow.



dachalan (flickr)

If you want someone to come on holiday with you, you have to tell them a story. If you ask them to go somewhere where the view from the hotel room is of a back alley dustbin, where the food is terrible and it rains all the time, they are not likely to want to go there. You have to paint a picture of a place they want to be, where the weather, food and scenery are amazing, where they'd be mad to miss such an adventure. (Pers. comm., 31 August 2012)

Rob's insight was that this is the same principle for creating the world we want to see. Many people instinctively – or eventually – turn away from stories that tell of doom and gloom, climate apocalypse, ecological collapse and their own inevitable suffering. But paint a picture in which the climate is stable; where we have reliable, nutritious and tasty local food supplies; where the local economy is thriving; where you have affordable and ecologically sound energy and heating; where you know and trust your community and those that provide your food and provisions – and you'll find that people realise this is not only something they want to see, but that they can create themselves.

But the drive and incentive for building this incredible new world – or town – around us is not just indulgent or artistic. There is also an element of self-interest and self-preservation driving many Transitioners, the 'stick' to the beautiful vision's 'carrot'. Where NGOs and community groups alike have been talking about climate change for years, for many ordinary people, living normal lives in towns and villages across the country, climate change still felt like a distant issue and one that would not necessarily affect them. The Transition view changed that, by making the links between climate change and peak oil abundantly clear.

The theory of peak oil, much like that of climate change, was resisted by oil companies, governments and vested interests for many years. However, it is now accepted as fact in almost all circles, unable to deny its inevitability and the abundance of data. Peak oil theory points out that the world's oil resources are not infinite. Discoveries of large deposits are dramatically slowing down and have become rare in recent years. In fact, world discovery of oil peaked in 1964 and has been declining ever since. In spite of improvements in technology, there is little prospect of significant new large discoveries.

However, our extraction and use of this resource is growing (in spite, or perhaps because of, agreements and compromises reached in the UNFCCC). We currently consume four barrels of oil for every one barrel discovered.

American geologist M.K. Hubbert coined the term 'peak oil' to define the point at which maximum extraction of oil is reached, after which extraction will decline. Analysing US oil well capacity and extraction, he correctly predicted that US reserves would peak in 1971. Production in the UK peaked in 1999. Taking into account the fact that 64 of the world's major oil producers have already peaked, the (un)likelihood of major new discoveries, and our insatiable rate of extraction, it is widely believed that we are now approaching world peak oil. And instead of

a slow and steady adaptation to this change, economic patterns suggest that once peak oil is reached and recognised, oil prices will rise and that they will do so dramatically.

Oil companies deny that we are running out of oil. And in a way, they are right. Globally, it is thought that half of the Earth's oil has been extracted. The problem is that it is the *cheap* oil, which is easy to extract, that is running out. The light sweet crude in accessible oil fields is now largely exhausted. Now the extractive industries are looking to inhospitable environments and low-quality inaccessible energy sources such as shale oil and gas, Arctic drilling and the Alberta tar sands. The fact is that these pose technical, ecological, political and many other challenges. We would not be exploring these options if there was anywhere else to go.

What does peak oil mean for us? Some might think it a cause for climate celebration if it means we use less oil. But it actually means that these difficult deposits release even more emissions in the extraction and processing of the oil. Furthermore, we live in the petroleum age, where almost everything in the modern world is dependent on oil. Getting food on to your plate requires fertilisers, tractors, shipping, aviation and road transport, processing, packaging and refrigeration. The average food item has travelled 1,000–1,500 miles before arriving on our plates. For every one calorie of food, on average 10 calories of fossil fuel energy have been used. Something as simple and basic as growing vegetables for food has been transformed into a distant and complex chain, each link of which is vulnerable to rising oil prices. Housing, heating, clothing and commodities – all of these are also vulnerable to peak oil shock. Look around you: what can you see in your home or office that was not, in some way, dependent on oil to reach you?

Peak oil is not a cause for celebration – it is a terrifying possibility. But it is also an opportunity, a huge incentive for us to create the world we want to see. Because, as it happens, the solutions for creating resilience to peak oil are also the solutions that can prevent climate change.

The brilliance of Transition is to realise that a town using much less energy and fewer resources than we presently consume, could, if properly planned for and designed, be more resilient, more abundant and more pleasurable than the present. Totnes is not far from the South Devon coast, and many Totnesians are surfers. Thus, the metaphor we found most apt then when facing the challenges of peak oil and climate change was that it is better to ride the wave than to be engulfed by it.

And ride the wave we have. In Totnes, determined folk have set up a community company to provide wind energy. One hundred and fifty homes have bulk-bought solar panels. Hundreds of homes are retrofitting to reduce their energy use. The community has designed an Energy Descent Action Plan, which has been taken up by the local council. A local currency, the Totnes Pound, encourages shoppers to support locally owned businesses in order to keep money circulating in the community.



Terry Rook, CPRE

The next phase of the work on food was to strengthen links to local food growers, and ensure that local grocers use as much locally sourced food as possible, in order to ensure minimal oil use and greater resilience in food supplies.

The Transition Town Totnes (TTT) Food Group began by focusing within the town's environs and community. The group, run almost entirely by volunteers, has planted vegetable beds and hundreds of nut trees in public spaces for public consumption. Gardening courses have been hugely popular as everyone realises that the most immediate thing they can do for their own resilience is to grow food. A scheme has been set up that enables elderly people with gardens to share them with families who want to grow food. TTT was part of a successful local campaign for more allotment spaces for food growing. Seed swaps, plant swaps, glut swaps and seed saving training are now a regular feature of the local calendar.

The next phase of the work on food was to strengthen links to local food growers, and ensure that local grocers use as much locally sourced food as possible, in order to ensure minimal oil use and greater resilience in food supplies. Totnes was already proud of its plentiful access to local food, but Transitioners recognised there was still much more that could be done to strengthen these links. A local food directory therefore identifies the many shops and restaurants that use locally grown food. A local organic labelling scheme that is affordable for small-scale farmers was extended to the area. An online resource for small-scale producers to connect to local consumers is being developed. Meanwhile, the Totnes FoodLink project has worked to identify the products wanted by shops and restaurants, and to connect them to farmers who can grow them.

A recent study by the Council for the Protection of Rural England found that more than two-thirds of outlets in town now stock local food, and that Totnesians across all income brackets are buying local produce. Nine out of 10 shoppers interviewed buy local, even though over half of those interviewed reported earning less than £20,000 a year. Local food sales in Totnes amount to £4-8 million per year. Such a vibrant local food system supports over 300 jobs in outlets in town (approximately 10 per cent of the local residents in work) and over 700 jobs at suppliers in the wider area. This is especially important in an area of rural deprivation where job opportunities are typically few.

The great thing about food is that it is easy to get involved with at every level. By eating and buying local food, you are already supporting a local farmer and creating a more resilient food economy for the future. Supporters of Transition can commit to all stages: they can attend talks, they can volunteer to plant trees or weed in the community garden. They can grow their own food. They can save and swap seeds, or they can join one of the many groups, share ideas and volunteer to organise and coordinate activities.

In other Transition Towns around the world, activities include a plethora of community gardens, land and local food activities as well as a diversity of strategies to enable access to renewable energy. They also include eco-housing, retrofitting, draught-busting, energy saving, bike fixing, skills-sharing, linen and wool processing, transport hubs, local currencies, tree planting, and much, much, much more. Each activity that reduces oil use also reduces the impact on climate change and increases resilience to economic turbulence. Each Transition Town makes use of the people, their passion, their expertise and their dreams, to make the town more resilient to peak oil and climate change in different ways.

The Transition Town movement presents an irresistible opportunity to ride the turbulent waves ahead and create the change that we wish to see in the world.

Surf's up, people!



Tai Gray

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Teresa Anderson is the International Advocacy Co-ordinator for the Gaia Foundation. She has been with Gaia since 2001, working with organisations and networks in Africa, Asia and Latin America on issues of agriculture, biodiversity, climate change and indigenous rights. In particular, she undertakes international advocacy work for the African Biodiversity Network, a network of over 40 grassroots organisations working to protect and revive vibrant and resilient communities rooted in their own biological, cultural and spiritual diversity. She lives in Totnes, Devon (UK), where she was founder and former co-ordinator of the Transition Town Totnes Food Group.

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ture. He is the executive director of the activist think tank EcoEquity. His principle interests are class division and global inequality, in the context of the global climate emergency – he seeks a global climate mobilisation that is fair enough to actually succeed.

Paul Baer is an assistant professor at Georgia Tech's School of Public Policy. He is a leading international scholar on climate change and justice, co-founder of EcoEquity and a co-author of the *Greenhouse Development Rights* policy framework. He does interdisciplinary work at the intersection of philosophy and policy analysis, and has been published in a wide range of scholarly books and journals. He received his PhD in 2005 from the Energy and Resources Group at UC Berkeley, his MA in Environmental Planning and Management from Louisiana State University in 1999, and his BA in economics from Stanford University back when Ronald Reagan was in his first term.

Tariq Banuri is professor of City and Metropolitan Planning at the University of Utah, with a special focus on sustainable development. He was previously Director for the UN Division for Sustainable Development; prior to that he headed the Asia office for the Stockholm Environment Institute and later became Senior Fellow and head of its Future Sustainability Programme. He co-ordinated the chapter on sustainable development for the IPCC's Third Assessment report, and contributed to the chapter on equity and social justice in the Second Assessment report. He has a PhD in economics from Harvard University.

Nnimmo Bassey is the Executive Director of Environmental Rights Action/Friends of the Earth, Nigeria, and Chair of Friends of the Earth International. Bassey co-founded the Environmental Rights Action (ERA) in 1993 in response to widespread environmental degradation and human rights abuses in Nigeria. He was listed as one of Time magazine's Heroes of the Environment in 2009, was a co-recipient of the 2010 Right Livelihood Award, also known as the 'Alternative Noble Prize', and received the Rafto Prize for Human Rights in 2012. Bassey's poetry collections include *We Thought It Was Oil But It Was Blood* (2002) and *I will Not Dance to Your Beat* (2011). His latest book is *To Cook a Continent – Destructive Extraction and the Climate Crisis in Africa* (2012).

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Niclas Hällström is the founder of the *What Next Forum*, a new institution that convenes thinkers and doers from multiple backgrounds to explore new and alternative ideas on environment and development in order to catalyse action for change. He previously worked as Associate Director for the Dag Hammarskjöld Foundation (1995–2008) where he led work on a range of issues from health to nuclear disarmament to climate change, including the cross-cutting What Next project. After leaving the Foundation in 2008, he followed the climate negotiations for the Swedish Society for Nature Conservation (2008–2010). He is also a founder of and lecturer at the Centre for Environment and Development Studies (CEMUS) in Uppsala, Sweden.

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Lim Li Ching is a Senior Researcher with Third World Network (TWN), an international NGO based in Malaysia, where she coordinates its sustainable agriculture work. Ching was a lead author in the East and South Asia and the Pacific sub-global report of the *International Assessment on Agricultural Science, Technology and Knowledge for Development* (IAASTD). She contributed to the Agriculture chapter of the UNEP publication, *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. She is co-editor of the book *Climate Change and Food Systems Resilience in Sub-Saharan Africa* published by FAO, TWN and the Institute for Sustainable Development, Ethiopia.

Larry Lohmann is a scholar and activist who works with The Corner House, a research and solidarity NGO in the UK that supports democratic and community movements for environmental and social justice. He is author of the book *Carbon Trading: A Critical Conversation on Climate Change, Privatisation and Power* (published by the Dag Hammarskjöld Foundation, 2006). He has authored books, chapters and articles on climate change, land rights, globalisation, racism, forest conflicts,

development, environmental change in Southeast Asia, and the politics of cost-benefit analysis. He took part in funding the Durban Group for Climate Justice.

Pat Mooney is the founder of ETC Group (Action group on Erosion, Technology and Concentration). ETC Group monitors new technologies and their impact on vulnerable communities. They pioneered monitoring of the corporate control of seeds and the emergence of biotechnology. Their current work focuses on issues and risks in relation to nanotechnology, synthetic biology and geo-engineering. Mooney is author of several *Development Dialogue* issues including *The Law of the Seed*, *The Laws of Life*, *The Parts of Life*, and *The ETC Century*. He is a recipient of the Right Livelihood Award.

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Kathy Jo Wetter has contributed to ETC Group's research, analysis and advocacy for more than a decade. She received a PhD from the University of North Carolina in 2001 with a dissertation focusing on medieval arguments for and against *techne* (art). Wetter's current research on emerging technologies – such as synthetic biology and geoeengineering – allows her to continue thinking about the rhetorical strategies used to promote *techne* as well as the real-world implications. She lives in Durham, North Carolina (USA).

Glossary

Some UN related Terms and Acronyms

The United Nations Framework Convention on Climate Change (UNFCCC) is the international global agreement signed at the Rio Earth Summit in 1992 to stabilise greenhouse gas concentrations in the atmosphere and prevent dangerous human interference with the climate system. Every year, negotiators from each country (known as a 'party') meet at the **Conference of the Parties (COP)**, to review global climate change targets and commitments. In 1997, the **Kyoto Protocol (KP)** was agreed by governments at COP 3 in Kyoto, Japan, which set legally-binding commitments for Annex 1 countries (see below) to reduce their greenhouse gas emissions (by on average 5.2 per cent compared to 1990), but also introduced market mechanisms ('carbon trading'). The Kyoto Protocol came into force in 2005, and its first commitment period ends in 2012. In 2007, at COP 13 in Bali, the **Bali Road Map** was drawn up to pave the way for an agreement on further efforts to address climate change, including both negotiations for the Kyoto Protocol's second commitment period (2013 and onwards) as well as a package of other issues (mitigation, finance, technology, adaptation, capacity building and long-term shared vision).

Adaptation – Activities to cope with the consequences of global warming, reduce vulnerability and increase resilience.

Annex I parties – The group of countries that committed themselves specifically in Rio to the aim of returning individually or jointly to their 1990 levels of greenhouse gas emissions by the year 2000. These include all the OECD countries and economies in transition (currently 41 countries). The terms 'developed countries' and 'The North' are often used as substitutes.

Annex II parties – Annex II countries include all OECD countries (but excluding several Eastern European countries with economies in transition) that are expected to provide financial resources to assist developing countries to enable both mitigation and adaptation, including the transfer of environmentally sound technologies.

Annex B parties – The countries that have agreed to a legally binding target for reductions of their greenhouse-gas emissions under the Kyoto Protocol. These include all the Annex I countries except for Turkey and Belarus. The US is a member of Annex B but has not ratified the Kyoto Protocol. Canada announced in Durban that it was withdrawing from the Kyoto Protocol.

CBDR – Common But Differentiated Responsibilities. A cornerstone of 'sustainable development', explicitly formulated in the context of the 1992 Rio Earth Summit. The first principle of the climate convention (wwUNFCCC) states: 'The Parties should protect the

climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities'. The CBDR thus has two components. The first is common responsibility, which arises from the concept of common heritage and common concern of humankind, and reflects the duty of states of sharing equally the burden of environmental protection for common resources; the second is the differentiated responsibility and unequal capability, which addresses unequal material, social and economic situations across states; different historical contributions to global environmental problems; and financial, technological and structural capacity to tackle those global problems. In this sense the principle establishes a conceptual framework for an equitable allocation of the costs for both mitigation and adaptation.

CDM – Clean Development Mechanism, an 'off-set' mechanism under the Kyoto Protocol with the explicit purpose of making emissions reductions less costly for Annex 1 countries. Through CDM developed countries may finance greenhouse-gas emission reduction or removal projects in developing countries, and receive credits for doing so which they may apply towards meeting mandatory limits on their own emissions.

G77 – The main negotiating bloc for developing countries, allied with China (G77+China), comprising 131 countries.

GCF – The Green Climate Fund. A UN climate fund established in Cancun and operationalised in Durban.

GHG – Greenhouse Gases. Natural and industrial gases that trap reflected heat from the Earth. The Kyoto Protocol restricts emissions of six GHGs: natural (carbon dioxide, nitrous oxide and methane) and industrial (perfluorocarbons, hydrofluorocarbons and sulphur hexafluoride).

LDCs – Least Developed Countries

LULUCF – Land Use, Land Use Change and Forestry

Mitigation – Reduction of emissions of greenhouse gases or increasing their sinks.

MRV – Measurement, Reporting and Verification.

Non-Annex 1 Parties – All countries except the Annex 1 countries. These countries do not have quantified, legally binding emission reduction commitments. The terms 'developing countries' and 'The South' are often used as substitutes.

REDD – Reducing Emissions from Deforestation and Forest Degradation.

Climate change already affects all of us, but those most vulnerable to its impacts have done the least to cause the problem. Unless radical cuts in emissions take place soon, the world is set for dangerous climate change, with all of humanity at peril.

This *What Next* Volume presents voices from across the North and South, addressing the combined challenges of climate, development and equity. It highlights the urgency of taking action, but also shows why any attempt to tackle climate change must be grounded in equity. How will humanity fairly divide the rapidly diminishing global carbon budget, while allowing billions of people in the global South (and North) the means for economic, social and environmental well-being? How can United Nations negotiations move forward, and what are the real and false solutions?

'These contributions from some of the world's most far-sighted commentators should be required reading for heads of state, policymakers, journalists, activists and the concerned public. Together they make the loudest call for political and individual action and give governments the legitimacy to act.'

John Vidal,
Environment Editor, The Guardian



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The *What Next Forum* is an independent initiative that builds on the previous work on 'Another Development' and the *What Next* Project at the Dag Hammarskjöld Foundation.

The *What Next Forum* seeks to facilitate dialogue and convene meetings, explore new issues, challenges and alternative views on development, and catalyse action for change.
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