

CLIMATE CHANGE, RISK & GLOBAL 'EMISSIONS TRADING'

"Contraction, Convergence, Allocation and Trade"

The potential economic costs of climate change are staggering. But, argue **Aubrey Meyer** and **Tony Cooper** current international policy options are inadequate. The answer lies in a truly global and equitable solution

Global weather patterns are becoming increasingly variable and violent as a result of the higher temperatures caused by humankind's pollution of the global atmosphere. According to figures released from German reinsurer Munich Re, economic losses from natural disasters have been doubling every decade, from \$53 billion in the 1960s to \$480 billion in the 1990s. 80% of these are from weather-related events. There is now great concern about these damages and the reasons for their increase. What can we do to limit further increases in these damages?

The objective of the United Nations Framework Convention on Climate Change (UNFCCC) is to stabilise the rapidly rising concentrations of greenhouse gases (ghgs) in the atmosphere at a level that prevents disaster.

The Kyoto Protocol - yet to be ratified - will impose collectively slight but legally binding commitments only on 'Annex Parties' to the UNFCCC, in other words on those from the developed country group only. They alone will have to reduce or limit their net GHG emissions by an average of 5.2% below 1990 levels, by the period 2008-2012.

As part of the process, the Protocol proposed the international trading of emissions permits and the so-called 'Clean Development Mechanism' (CDM).

The questions are will this trading happen, how will it be structured and will it help?

If the planet's climate system is to be protected from dangerous disruption, a rapid and orderly retreat from fossil fuel dependency in favour of clean and renewable forms of energy is needed. Emissions trading must be primarily structured and directed to this end. It will become a vital part of the process preventing the climate from changing catastrophically if it is. If it is not, it will make matters worse.

We argue that the answer is "Contraction, Convergence, Allocation and Trade" [C-CAT]. In a nutshell, countries agree a reviewable global greenhouse gas emissions 'contraction budget' to match a precautionary and safe future stable value for the rising (ghg) concentrations. The internationally tradable shares in this budget are then agreed on the basis of 'convergence' from now, where shares are proportional to income, to a target date in the budget time-line after which they remain proportional to an agreed base year of global population.

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Since 1860 the global economy has grown exponentially as a result of fossil fuel fired industrialisation. During this period humanity has collectively released an accumulated 250 billion tonnes of this carbon from the burning of oil, coal and gas to the global atmosphere (chart). These fossil fuel emissions have been increasing at an average rate of 2% a year, to a current annual output of around six billion tonnes of carbon from CO₂.

CO₂ emissions from fossil fuel burning represent the principal contribution to human enhanced global-warming. Half of these emissions have remained in the atmosphere, raising CO₂ concentrations there by 35%, from the pre-industrial 280 parts per million by volume (ppmv) to a current 370 ppmv and with it, temperature by almost 1°C. These trends are set to continue unless a major effort is made to change them.

Climate scientists agree that to stabilise these rising concentrations - and hopefully thereby rising temperature - requires cuts of 60%-80% of these emissions globally as soon as possible. The longer the delay the higher the concentrations will be. The risk of temperature rising at a rate that dangerously accelerates the rate of global climate changes increases exponentially proportional to delay. Because of positive feedbacks, delay potentially takes us beyond our ability to prevent damages at all. In this worst case scenario, increasingly huge numbers of people will die in these.

Extrapolation and guesswork about the future effects of climate change misses the point. For dangerous changes in global climate to be avoided, a precautionary framework for practical, commercial-assisted action has to be devised, agreed and implemented.

The UNFCCC identified potentially dangerous climate changes as a global problem. Its global objective is seen as dependent on observing the principles of precaution and equity along with the need for 'cost-effective' measures.

In a literal sense the UNFCCC can already be seen as the "United Nations Framework Convention for Contraction and Convergence", because it embraces the: -

- precautionary imperative of contracting human emissions of greenhouse gases globally by 60%-80% as soon as possible;
- diplomatic imperative of 'convergence', that is having a framework to share this international task on the basis of global equity; and
- potential efficiency benefits of using market mechanisms – such as international emissions trading and the CDM – to maximise globally equitable emissions reductions per unit of expenditure.

However, because emissions reduction under Kyoto are restricted to the industrialised world, the US is ambivalent about ratification, saying that it is 'anti-competitive.' Its position has been that this global problem requires a global solution, including participation – that is, with binding emissions limits – by developing countries.

Developing countries have justifiably argued that as the industrial countries have grown rich emitting an accumulated 80% of the emissions so far, they should take the lead in cutting the emissions now without seeking to impose limitations on the rest of the world.

This argument has dogged negotiations at the UN for the last ten years. Even if it is temporarily overcome at the 6th Conference of the Parties to the UNFCCC in the Hague in November this year, approval of the US Senate is required for US ratification of the Kyoto Protocol. Without this the Protocol seems unworkable.

And even if this US veto is overcome, or if some key developing countries are persuaded to accept legally binding emissions restraint now and the Protocol is ratified, the problem won't have gone away. It is obviously global and global participation in global GHG reduction is obviously needed.

For the moment the international dispute is further complicated by the fact that rules about tradable emissions rights – which are presently sub-global in scope – are under the UNFCCC's global governing principles. Can the rules for sub-global emissions trading envisaged under Kyoto be viable if they are in conflict with the global principles of precaution and equity already agreed in the UNFCCC? Emissions trading can only occur between countries that have accepted emission reduction or limitation commitments. This means strictly that the principles of this new form of 'ownership' must be pre-defined, quantified and internationally accepted before it can be traded.

Developing countries are sometimes portrayed as seeking to influence the rules governing a scheme they have refused to join. In fact their position has evolved over the past few years. The position that developed countries must take the lead has come to seem that just as 'rights' and 'responsibilities' are two sides of the same coin, that 'commitments' are also 'entitlements'. And in many recent statements they have said - consistent with the sequenced logic of cap-and-trade - international emissions trading should be *a priori* dependent on equitable entitlements to all countries, agreed by all countries. This was the key battle in the run-up to Kyoto that led to Article 17 on trade and COP-6 remains pointed at this battle much as before.

If international trading of such emissions 'commitment/entitlements' is to occur and in a way that lowers both the overall damage costs and the costs of avoiding the damage, resolving this argument is of fundamental strategic importance.

The parliamentarian's network GLOBE International has realised this and are consequently advocates of C-CAT. As their president Tom Spencer said at COP-4 in Buenos Aires in 1998, we must now move from the half-truth of sub-global commitments to the whole truth of global entitlements.

Despite the fact that global rights and global responsibilities are obviously inseparable, key developed countries - such as the UK - have remained slow to recognise it. 'Commitments' obviously become 'entitlements' as soon as they become tradable, as trading what you don't own is theft.

As if to prove the point, the UK recently announced their option to sell an 8% 'over-achievement' against the UK's emissions reductions commitment agreed in Kyoto (1990 levels minus 12% by 2008 - 2012), to the US for around £100 million.

From a developing country perspective, this actually amounts to profiting from 'under-commitment' rather than 'over-achievement', at a time when increasingly violent cyclones are causing damages and death in place like Venezuela, Orissa and Mozambique. In other words the UK should have held to their original commitment of minus 20% reductions as the Germans and the Danes have done as its part of the deal in Kyoto.

GLOBE and GCI are part of a growing network of individuals, institutions, parliaments and governments North and South who recognise that C-CAT is the straightforward way to resolve all this. Because all countries must have targeted and timetabled commitment/entitlements to control emissions to achieve the objective of the UNFCCC, a global method of applying its global principles of precaution and equity is inevitably required.

Contraction means that, for precautionary reasons, all governments must collectively agree to be bound by an ultimate global target for safe and stable atmospheric ghg concentration. It would remain subject to annual scientific and political review. This makes it possible to calculate the diminishing amount of carbon dioxide and the other greenhouse gases that the world can release for each year in the coming century while staying within this target.

Convergence means that each year's ration of this global emissions budget gets shared out among the nations of the world so that every country converges on the same allocation per inhabitant by an agreed date. This rate of convergence is negotiable. This method recognises that logic requires a pre-distribution of the rights to the 'global commons' of the atmosphere based on globally equal rights per capita.

Once agreed, countries unable to manage within their shares would, within limits, be able to buy the unused parts of the allocations of other, more frugal, countries. Sales of unused allocations would give the countries of the South the income to purchase or develop zero-emission ways of meeting their needs. The countries of the North would benefit from the export markets this restructuring would create. And the whole world would benefit from the slowing the rate at which damage was being done.

Because this is an effective, equitable, efficient and flexible framework in which governments can co-operate to avert climate change, even some fossil fuel producers have begun to demonstrate positive interest in the concept.

The under-recognised irony is that this matches the positions taken by the; -

- (1) US Government in June 1997 in the so-called Byrd Hagel Resolution
- (2) The Africa Group of Nations during the pre-Kyoto negotiations
- (3) The Non-Aligned Movement (NAM) at their Summit in Durban in Sept. 1998
- (4) The European Parliament in 1998/9 and
- (5) An increasingly numerous list of organisations and individuals around the world who explicitly advocate "C-CAT" model.

As an example, if GDP continues to grow at 3% a year for the next hundred years while the damages continue to grow at 10%, global damages exceed global GDP by 2065! The imperative of avoiding this trend is self-evident.

The 'traded area' between 2000 and 2100 in the accompanying C-CAT graphic represents a potential exchange between the North and the South. It is equivalent to 100 billion tonnes of carbon or one sixth of the total carbon budget - and a significant fraction of the damages - avoided for that period, if it is an exchange of no-emissions technology and know-how. The carbon is equal to 500 trillion 1995 global \$/tonnes, but this is merely an average of 2% GDP a year for the next century.

The imperative now is to direct the larger % of this into this clean energy transition up front, because the risk is all front-end loaded. The obvious need for this is disguised only by the fact that 'economics' is a snap-shot discipline that also regards the poor (Orissa Mozambique) as being an 'affordable' damage cost. Since there's no net meaningful GDP 65 years out, this discipline destroys us all in the end.

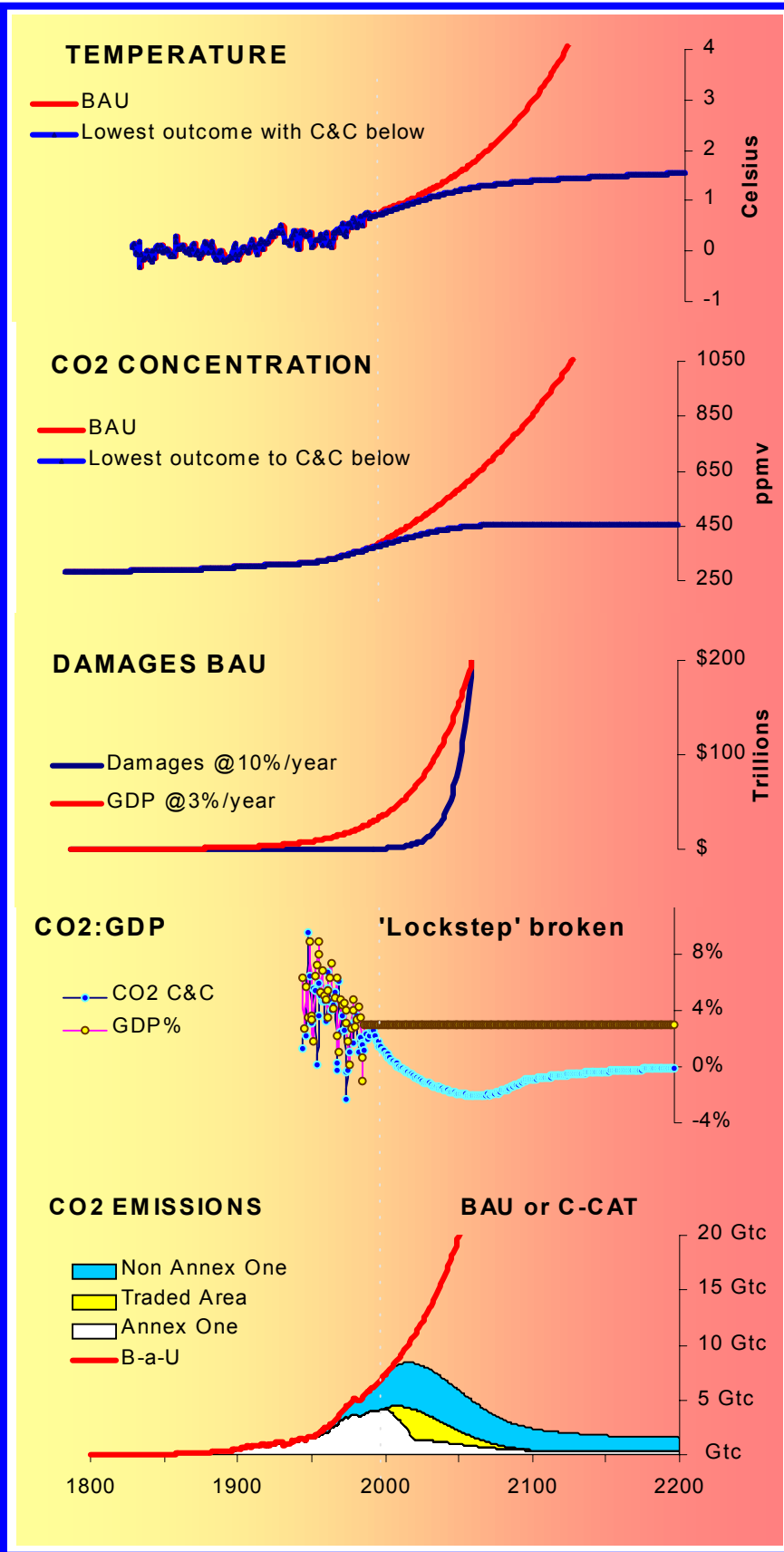
The central challenge to governments is establishing the precautionary global framework of C-CAT now. The central challenge to industry, and especially the insurance sector, is in realising the global economic value of becoming supporters and advocates of such a framework, by realising the global market opportunity that the rapid, orderly retreat from fossil fuel dependency creates.

With the framework agreed, we have a chance of avoiding the worst of the immense damages to come. Without it we haven't got a chance. Moreover, as soon as the fossil fuel producers and the associated technology producers know that there is a global emissions cap secured by an international long-term agreement to share on the basis of convergence, the real value of emissions trading is secure. The greatest incentive in trade under these conditions will not – as at present – be to filibuster and cheat. It will be to conserve both the value of carbon permits and the possibility of prosperity everywhere by switching to the capture and potentially endless use of renewable energy.

In the polarised world of North/South relations, some members of GLOBE have called C-CAT the “trade for equity swap”. Using emissions trading to avoid carbon by funding no emissions technology and development instead, particularly to start with in the developing world, lowers the global bill for damages while buying time for the orderly retreat from fossil fuel dependency in the North.

However, with C-CAT up and running, this is trade for equity and in the best sense – global equity, survival and prosperity for everyone.

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Recorded surface temperature from 1860 until 2000 shows an overall rise of 0.9°C so far. The future projections are following CO₂ emissions and atmospheric ghg concentrations (in ppmv - parts per million by volume). The red line shows Business-as-Usual (BAU) where the underlying emissions grow at 2%/yr. The blue line shows the lowest possible climate sensitivity - a total rise of 1.5°C - assuming a 60% global emissions contraction by 2100.

Recorded rise in atmospheric CO₂ concentration from 1860 until 2000 shows an increase of 34% over pre-industrial levels. This is a rise both higher and a faster than anywhere in the ice-core sampling back 440,000 years before now. Concentrations are rising as the result of accumulating emissions. In future, the worst case is the red line as BAU. The best case sees this rise stabilised at twice today's level due to a 60% global contraction in the underlying emissions by 2100.

Damages here are the global economic losses (Munich Re) for the four decades past for all natural disasters projected at the observed rate of increase of 10% a year in comparison to global \$GDP at 3%. If the global trends continue BAU, damages will exceed GDP by 2065. The risks will soon become uninsurable beyond the capacity of the insurance industry and governments to absorb and the damages will be beyond the capacity of societies to cope. Damages will rise for the century ahead even with emissions contraction, but the rate can be reduced if C-CAT is rapid and orderly.

For the past four decades, the output of CO₂ and GDP from global industry have been correlated nearly 100% (known as the 'lock-step'). Future GDP is projected here at 3% a year. Future CO₂ goes negative equal to the retreat from fossil fuel dependency shown below, that limits CO₂ concentrations to 70% above pre-industrial levels, shown above. Breaking the lock-step needs up to minus 5% annual emissions globally to reduce the probability of appalling damages.

The redline shows BAU CO₂ emissions. The solid segments show "Contraction, Convergence, Allocation and Trade" [C-CAT] to manage emissions down by at least 60% within a given time frame with an agreed 'contraction budget' (here 680 billion tonnes of carbon). The internationally tradable shares of this budget result from convergence to equal per capita by an agreed date and population base year (here 2020). The 'traded area' is the difference between that and convergence by 2100 (here, 100 billion tonnes). If this is invested in no-emissions technologies, risk and damages are lowered further as the budget is then net of these emissions as well.