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Abstract

Will there be an international climate treaty to follow Kyoto when it expires in 2012, and if so what will it look like? Many climate justice and anti-capitalist spokespersons denounce the Kyoto Protocol as a "pretend solution" and reject international carbon trading altogether. This article argues that, on the contrary, an international cap and trade treaty is the only way to avert climate change fairly before it is too late, and that the Kyoto Protocol is a framework that progressives should defend and fix rather than condemn and nix. After explaining why many climate justice and anti-capitalist criticisms of carbon trading are without merit and fail to appreciate how international carbon trading can favor lesser developed countries (LDCs), five changes to make a post-Kyoto cap and trade treaty more effective and fair are proposed, and common arguments against carbon trading are rebutted.

JEL codes: Q54, Q56, Q58

Keywords

Kyoto, carbon markets, clean development mechanism, climate justice

There is a growing divide among leftists over how to respond to the threat of climate change. On the one hand many progressive environmentalists are fighting to keep the United Nations Framework Convention on Climate Change (UNFCCC) in control of negotiations, to preserve positive features of the Kyoto Protocol, and to respond to valid criticisms of carbon trading by fixing the cap and trade framework to be more effective, fair, and efficient. On the other hand, spokespersons for climate justice (CJ) and anti-capitalist (AC) movements routinely denounce UNFCCC negotiations and Kyoto as "pretend solutions" and reject cap and trade policies altogether. This article argues that many CJ and AC arguments are based on faulty economic analysis, and that support for the UNFCCC and an improved cap and trade post-Kyoto treaty is critical if we are to avert climate change, and perfectly consistent with calls for "system change."

Section 1 documents CJ and AC positions on carbon trading that will be criticized. Section 2 explains why much CJ criticism of carbon trading under Kyoto is misinformed. Section 3 proposes five changes that fix the valid criticisms of Kyoto which leftists should support in a post-Kyoto treaty. Section 4 responds to common criticisms of carbon trading. Section 5 explains why

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abandoning a cap and trade treaty for an international carbon tax would be ill-advised. Section 6 comments briefly on the relationship between fighting to avert climate change in the here and now and fighting for "system change."

1. Left Denunciations of Carbon Trading

This section quotes from communiqués issued by coalitions of CJ and AC organizations over the past six years, from the recent Cochabamba Protocol, and from the writings of several well known spokespersons for the CJ movement. This should suffice to establish that the positions criticized in this article are sufficiently widespread on the left to warrant a response.[1]

In October 2004 the "Durban Declaration" was issued by a network of CJ organizations including Climate Justice Action, Climate Justice Now!, Third World Network, Focus on the Global South, and the Peoples Climate Justice Movement. The declaration stated: "As representatives of people's movements and independent organizations, we reject the claim that carbon trading will halt the climate crisis. History has seen attempts to commodify land, food, labor, forests, water, genes and ideas. Carbon trading follows in the footsteps of this history and turns the earth's carbon-cycling capacity into property to be bought or sold in a global market. Through this process of creating a new commodity—carbon—the Earth's ability and capacity to support a climate conducive to life and human societies is now passing into the same corporate hands that are destroying the climate . . . . We denounce the further delays in ending fossil fuel extraction that are being caused by corporate, government and United Nations' attempts to construct a 'carbon market.'"

In December 2009 a larger network of CJ and AC organizations demonstrating in Copenhagen issued "System Change—Not Climate Change: A People's Declaration from Klimaforum09." The Clean Development Mechanism (CDM) and Reducing Emissions from Deforestation and Degradation (REDD) are described in the document's summary as "market oriented, false and dangerous solutions" which the signatories "reject." The Klimaforum09 declaration emphasizes that "no false, dangerous, and short-term solutions such as offsetting and carbon trading should be promoted and adopted." In section 4 the declaration states that the CDM and REDD "only produce new environmental threats, without really solving the climate crisis," that "carbon trading and offsetting are false and unjust," and that "allowing rich countries to offset their reduction obligations has maintained the unjust and unsustainable system." Section 5 states: "Instead of the regime of tradable emission quotas we demand an equitable tax on carbon emissions."

On April 26, 2010 the World People's Conference on Climate Change and the Rights of Mother Earth, attended by more than 40 official government delegations, thousands of activists and representatives of social organizations, and hosted by the President of Bolivia, Evo Morales, issued the "People's Agreement on Climate Change and the Rights of Mother Nature." Among other things this "Cochabamba Protocol" declared "we condemn market mechanisms," "the carbon market has become a lucrative business and is not therefore an alternative for tackling climate change," and "we consider inadmissible that current negotiations propose the creation of new mechanisms that extend and promote the carbon market." The Cochabamba Protocol specifically condemns REDD which it describes as "violating the sovereignty of peoples . . . the customs of peoples, and the Rights of Nature."

[1]In the main these communiqués argue that neoliberal capitalism is primarily responsible for the crisis of climate change and that "system change" is required. The author of this article has long agreed with both points, and only disputes the treatment of Kyoto and carbon trading.

Brian Tokar is the director of the Vermont-based Institute for Social Ecology and is widely considered a spokesperson for the CJ movement. In "Politics-as-Usual While the Planet Burns" published on ZNet July 2, 2009 Tokar describes a carbon offset as "the postmodern version of the indulgences the Catholic church used to sell in the Middle Ages to buy your way out of sin," and as one of the most "egregious features of the largely failed Kyoto Protocol" because it is a "Trojan Horse" that punctures "a hole in the global emission cap." Tokar also raises the specter of a "$10 trillion a year carbon market perhaps launching the next financial bubble."

Patrick Bond is director of the Centre for Civil Society at the University of KwaZulu-Hatal School of Development Studies in Durban, South Africa, and is also widely recognized as a spokesperson for the CJ movement. On January 10, 2010 Bond wrote in his ZNet column that the Copenhagen "summit meltdown . . . should be celebrated" because it was a "step forward for the CJ agenda which requires us to avoid carbon trading distractions." He argued that carbon markets "currently worth around $130 billion a year were expected to soar to $3 trillion in annual turnover by 2020 had Copenhagen succeeded," but that fortunately "gridlock means there's a good chance that carbon trading will simply die." In response to recommendations for how to keep carbon trading from puncturing holes in the global emission cap Bond wrote: "Patching the holes in emissions markets is just as objectionable as polishing the chains of climate apartheid," and argues instead for "banning all carbon market activity."[2]

2. Carbon Trading Under Kyoto: Myth vs. Reality

Critics complain that under Kyoto carbon trading undermines the ability of the treaty to reduce overall, global emissions. For the most part this is not true. Moreover, critics fail to acknowledge that there are easy ways to prevent this from happening in a post-Kyoto treaty, and that carbon trading under Kyoto reduces global inequalities.

2.1 Trading between Annex-1 governments. Under Kyoto more developed countries (MDCs), designated as "Annex-1" signatories, have agreed to reduce annual emissions from within their territories in 2012 by a specified percentage as compared to their annual emissions in 1990. This implies a cap on the number of tons each Annex-1 country is permitted to emit in 2012. Suppose the government of Japan exceeds its cap by 10 million tons. If Canada comes in under its cap by 10 million tons, then Canada can sell "credits" for 10 million tons to Japan, which Japan can use to make up its deficit.

As long as Canada actually reduced its emissions by 10 million tons more than required by Kyoto, then total emissions reduction in Canada and Japan together are obviously exactly what they would have been had the two countries each met their Kyoto quotas through internal reductions. Moreover, monitoring to make sure this is the case requires only the ability to verify Canadian national emissions, which is necessary even if Annex-1 countries were not permitted to trade credits with one another. So if Annex-1 governments meet their treaty obligations it is impossible for any trading between Annex-1 governments to undermine the overall emissions reductions those countries agreed to.

2.2 Trading between individual sources in different Annex-1 countries. Suppose a Japanese power company buys certified emissions reductions (CERs) for 100 tons from a Canadian power

[2] *The Story of Cap and Trade* is a short film made by The Story of Stuff Project and Free Range Studios in partnership with Climate Justice Now! and the Durban Group for Climate Justice. It was released just before the Copenhagen Climate Summit and is widely circulated in CJ circles. Patrick Bond and Daphne Wysham, a fellow of the Institute for Policy Studies in Washington, DC who works on climate issues, were both content advisors for the film which is an example of the misleading and ill-advised positions on carbon trading criticized in this article.

company. This allows Japan to exceed its national emissions under Kyoto by 100 tons because after counting actual reductions in Japanese emissions any CERs *purchased* by sources inside Japan from sources outside Japan are *added* to Japan's measured, national emission reductions. However, and this is the crucial point, when a source within Canada sells CERs for 100 tons to a source outside Canada, Canada must reduce its national emissions by 100 tons more than its reduction quota because after counting reductions from within Canada any CERs *sold* by sources inside Canada to sources outside Canada are *subtracted* from measured Canadian reductions. If the CERs sold by the Canadian power company are legitimate, i.e. the Canadian power company actually reduced its emissions by 100 tons more than it would have otherwise and this actually lowered Canadian emissions by 100 tons, then it is easy to see that trading CERs did not reduce total emissions reductions in Canada and Japan combined. The 100 tons the Japanese power company did not reduce is made up for by the 100 additional tons the Canadian power company did reduce. But what if CERs are not legitimate? What if the Canadian seller of CERs is cheating?

A great deal of CJ criticism has been focused on private parties who *in lieu* of reducing their own emissions buy CERs that are not legitimate because no actual reduction on the part of the seller took place, because the actual reduction was less than the amount certified, because the reduction would have taken place in any case, or because the reduction that took place allowed an increase in emissions somewhere else in the country. Moreover, critics point out correctly that the Japanese power company buying the CERs has no reason to care if the CERs are legitimate or not. The market for CERs is not like the market for apples where the buyer can generally be relied on to monitor the "integrity" of the exchange by refusing to pay for rotten apples. The piece of paper certifying the CERs is the only thing that matters to the Japanese power company because that is what they present to the Japanese government *in lieu* of a 100 ton reduction in their own emissions. What really did or did not take place in Canada is of no concern to the Japanese buyer of the CERs. Nor does the Japanese government care if the CERs they will accept without question from the Japanese power company were legitimate. The Japanese government will present those CERs for a 100 ton reduction to those in charge of verifying that Japan has met its treaty obligations, who will simply add those CERs for 100 tons to the measured reductions from within Japan, also with no questions asked. Much of the CJ literature criticizing carbon trading consists of exposés of cases where certification and sales have taken place when the reductions were not legitimate. But what critics fail to understand is that if the seller of a bogus CER is located within an Annex-1 country this does not erode overall emission reductions as long as the seller's Annex-1 country is forced to comply with its national obligations under Kyoto.

Suppose the CER for a 100 ton reduction sold by the Canadian power company to the Japanese power company is completely bogus, a pure hoax. Under Kyoto, Japan can now emit 100 tons more than it would have been permitted to otherwise. The Canadian power company, by assumption, will not emit any less than it would have in any case. However, the country of Canada will now be required to emit 100 tons less than it would have been required to otherwise because a source within Canada sold CERs for 100 tons to a source outside Canada, and those responsible for verifying that Canada has met its Kyoto treaty obligations will add 100 tons to the reductions Canada is required to make. So global reductions will be exactly equal to the global reductions agreed to by Canada and Japan even if the CERs are totally bogus, as long as the Canadian government is forced to meet its obligations under Kyoto.

In other words, the effort to avert climate change is not "cheated" when sources in Annex-1 countries sell bogus CERs to sources in other Annex-1 countries. But if not the environment, then who has the devious Canadian power company cheated by accepting a handsome payment for doing nothing? Usually when a seller cheats, i.e. sells a rotten apple, it is the buyer who is

cheated. However, in this case the Japanese power company got exactly what it wanted: the CERs for 100 tons which allowed it to emit 100 tons more than it could have otherwise. But if neither the environment nor the buyer of the bogus CERs were cheated by the Canadian power company scam, then who was cheated? Could this be one of those so-called crimes without victims? Unfortunately not.

The Canadian power company has cheated its fellow Canadians. By selling bogus CERs it has forced Canada to reduce its emissions by 100 more tons than it would have had to otherwise. Somebody *else* in Canada is going to have to reduce their emissions by 100 more tons than they should have had to. Or somebody *else* in Canada is going to have to buy CERs for 100 tons from a source outside Canada they should not have had to buy. Or the Canadian government is going to have to buy credits for 100 tons from another Annex-1 government that it should not have had to buy to avoid being in violation of the Kyoto treaty. The cap on Canadian national emissions will force some other Canadian to make up the difference and plug the hole the devious Canadian power company punctured in the global cap when it sold a bogus CER to a Japanese power company. It is these "other Canadians" who have to make up the difference who are the victims when a source in Canada sells bogus CERs to someone in another country.

The key is that the international treaty organization must be able to measure aggregate, annual emissions from Canadian territory in 2012. Once this is done, any Canadian government sales of credits to other Annex-1 governments, and any private sales of CERs by parties within Canada to parties outside Canada, are added to measured emissions, and any Canadian government purchases of credits and any private purchases of CERs by parties within Canada from parties outside Canada are subtracted from Canadian measured emissions. Those verifying Canadian compliance with its obligations under Kyoto simply compare the resulting number to the cap Canada committed to when it agreed to (a) its percentage reduction by 2012, and (b) a figure for Canadian emissions in 1990. If measured emissions in Canada, plus credits and CERs sold to outsiders, minus credits and CERs purchased from abroad are higher than Canada's cap, the government of Canada is in violation of its treaty obligations and subject to whatever sanctions have been established. But will it really be possible to measure annual national emissions? Many critics insist that measurement problems are the Achilles's heel of a cap and trade treaty and it is unrealistic to assume these measurement problems will be solved.

No area of climate policy is more misunderstood than measuring and monitoring. There is a huge difference between (1) monitoring country compliance with caps on national emissions during a calendar year, i.e. policing governments who are the signatories of treaties, and (2) determining how much credit to award a particular project for reducing emissions, i.e. policing the international carbon market. Failure to understand crucial differences between the measurement problems posed by these two completely different tasks has been the source of a great deal of confusion and many misplaced criticisms of Kyoto. Obviously when we measure national emissions during an entire calendar year, the scale of what we measure is much, much greater than measuring how many tons a single project reduces emissions. Nonetheless, and as surprising as this may seem, measuring national annual emissions is far easier than measuring the amount by which a particular project reduced greenhouse gas emissions. The reason is that in the first case we do not need to create a hypothetical scenario of what would have happened had something not occurred.

How will the Kyoto treaty managers measure national emissions in 2012? The treaty staff will not attempt to measure the amount of different greenhouse gases coming out of all the smokestacks, automobile exhaust pipes, and cows in a country. Instead, treaty staff will estimate national carbon emissions based on statistics already supplied by governments to the United Nations about (a) the goods and services produced by their various industries and agriculture during 2012, (b) the predominant technologies used in different sectors, and (c), most importantly, the amount

of fossil fuels consumed by their energy and transportation sectors in 2012. Since burning or cutting down forests also releases carbon, additional information about deforestation during 2012 may also be collected from governments, although satellite photos may also be used. Will the resulting estimates of national emissions in 2012 be perfect? No they will not. But just as the equally imperfect estimates of national emissions in 1990 they will be compared to were agreed to with very little squabbling when countries ratified Kyoto, the estimates for 2012 will be agreed to with little squabbling between treaty staff and national governments as well. The estimates will be good enough to determine if governments of Annex-1 countries lived up to their treaty obligations and how much countries fell short of meeting their caps for purposes of assessing fines or penalties.

Interestingly, it would be even easier to measure the amount of carbon sequestered during 2012 in the national territory of each country, although the staff will probably not perform this calculation, since unless REDD is approved, Kyoto does not currently award credit for preserving existing sinks. Thanks to the system of global satellites already in place, every square inch of planet Earth can be monitored from the sky to see what is located there. Thanks to global biological mapping we know what flora is on all that land, and thanks to global temperature and rainfall records we know how much carbon the particular flora on all that land sequestered during the year given temperature and humidity conditions. This means that not only is measuring annual carbon emissions for a country relatively straightforward, measuring annual *net* carbon emissions for a country, i.e. annual carbon emissions minus annual carbon sequestration, is equally straightforward.

On the other hand, how does one decide how many credits to award a project that applies for emission reduction credits? CERs should be awarded only if the project reduces emissions above and beyond what would have occurred had the project never taken place. But determining this requires establishing a hypothetical "base line," i.e. a scenario of what would have happened had the project never occurred. Does this sound complicated? Yes, it is. Difficult? Yes, it is. Does it require difficult judgment calls? Yes, it does. Is it easy to question the certifying agency's decisions? Yes, it is.

If all these problems were not enough, further difficulties those who must decide how many CER credits to award particular projects face, but those measuring *annual* net national emissions do not face, are timing and permanence. These problems can be particularly troubling when awarding credits for sequestration services which continue over a number of years, and may or may not be guaranteed permanently. Projects often change emissions and sequestration over a number of years, and while it does not matter *where* changes in net carbon emissions occur, it does matter *when* they occur, and it matters whether or not the changes are permanent. The earlier reductions in net emissions take place, the more valuable they are in averting climate change. And obviously, a permanent reduction in net emissions is far more valuable than a reduction that is only temporary.

In conclusion, when evaluating the consequences of carbon trading it is important to remember that measuring national, annual emissions (or net emissions) is far easier and less controversial than measuring how much any particular project reduced net emissions as compared to what emissions would have been had that project never taken place. In the case of carbon trading between sources located in Annex-1 countries, if Annex-1 governments meet their treaty obligations—which is *not* difficult to measure and verify—then it is *impossible* for any trading between individual sources in Annex-1 countries to undermine the overall emissions reductions those countries agreed to, *no matter how much chicanery is involved in the certification and trading process.* This is an important point many critics fail to understand.

2.3 Trading between Annex-1 and non-Annex-1 countries: The Kyoto Protocol allows private parties in Annex-1 countries which are capped to purchase CERs from projects located in non-Annex-1

countries where emissions are not capped through the Clean Development Mechanism (CDM). Critics argue that carbon trading between sources in Annex-1 and non-Annex-1 countries through the CDM undermines the effort to reduce global emissions since countries with caps can avoid domestic reductions by purchasing CERs from countries which are permitted to increase emissions without limit. Critics have a valid argument *if the CDM accreditation process fails to work as it is supposed to.* However, it is important to understand that if the accreditation process accomplishes its mission, carbon trading through the CDM mechanism does not diminish global reductions and provides a significant transfer of income from MDCs to LDCs in any case.

The CDM Executive Board (EB) is supposed to grant CERs only to projects in non-Annex-1 countries if (a) the project represents a real reduction in greenhouse gas emissions, (b) the reduction is "additional," i.e. above and beyond what would have occurred had the project not taken place, and (c) the project does not create "leakage," i.e. the project does not cause an increase in emissions elsewhere in the country that would not have occurred had the project not happened. As explained above, determining (b) and (c) requires establishing a "base line"—a hypothetical scenario of what would have happened had the project never occurred—which is obviously the most problematic part of the exercise. However, to the extent that the CDM Executive Board—with the help of Designated National Authorities (DNAs) in non-Annex-1 countries and professional private contractors called Designated Operational Entities (DOEs)—only approves "Project Design Documents" (PDDs) which meet the three criteria above, carbon trading through the CDM does not undermine global emission reduction targets. Instead, it merely lowers the cost of reductions and distributes the efficiency gain from doing so between MDC purchasers and LDC sellers of CERs.

Under Kyoto there is a cap on Canadian emissions but not on Mexican emissions. Suppose a company in Mexico sells a CER to a company in Canada. Further suppose the CDM Executive Board did its job and the reduction is real, additional, and causes no leakage. So far the trade reduces global emissions by the same amount as had the Canadian company reduced emissions itself and the project in Mexico never occurred. The only difference is that the reduction took place in Mexico and costs the Canadian company less than it would have otherwise. However, since there is no cap on emissions in Mexico is it not possible that Mexican emissions will increase? Is it not possible that rather than achieving a reduction in global emissions by mandating a reduction inside Canada, instead we get no reduction in emissions in Canada, and even though the credits sold by the Mexican company were legitimate other sources in Mexico will increase emissions leaving us with no reduction, or even an increase in global emissions?

With no cap on Mexican emissions this could happen. However, when CERs are legitimate it is not trading that causes this problem, it is the lack of a cap on Mexican emissions that makes it possible for emissions in Mexico to increase. Since so many critics have misunderstood this issue it warrants more careful scrutiny at risk of belaboring the obvious. Consider what would happen if no trading were allowed between sources of emissions in Canada and Mexico. Mandated reductions for wealthy, industrialized countries, no mandated reductions for developing economies, and no trading is what some CJ critics who want to shut down the CDM mechanism favor.

Under such a program where no trading is allowed we would get reductions in emissions from sources in Canada, but there would be no reason for sources in Mexico to do anything different than they were going to do anyway. If sources in Mexico were going to reduce emissions they would still reduce them. If they were going to increase emissions they would still increase them. It is possible that global emissions would fail to decline because emissions in Mexico might increase by more than emissions decline in Canada. But this is obviously not because we allowed trading, since we did not allow trading in this scenario. Instead, it is because we failed to cap emissions in Mexico. Moreover, both Mexico and Canada would be worse off because trading

was prohibited. Sources in Canada would have to pay more to reduce their own emissions than it would cost them to buy legitimate CERs from Mexico. And sources in Mexico would be unable to profit from selling legitimate CERs for more than it cost them to reduce their emissions. In sum, no useful purpose is served by prohibiting trading as long as CERs are "real," "additional," and do not cause "leakage."

However, some CERs that have been approved by the Executive Board of the CDM clearly have not been legitimate. As explained, it is not easy to determine how much more emissions were reduced because of a project than would have occurred in any case. And if CERs are not "legitimate," i.e. if the accreditation process fails to carry out its admittedly challenging mandate successfully, then criticisms that trading through the CDM punctures holes in Kyoto's cap on aggregate emissions from all Annex-1 countries are valid. If a CDM-approved project does not represent "additional" emission reductions, or creates "leakage," trading will cause global reductions to be less than planned since non-Annex-1 countries without caps do not have to make up for any short-fall due to sales of illegitimate CERs with real reductions elsewhere in their countries. Moreover, since governments of non-Annex-1 countries selling CERs have no incentive to police the legitimacy of CERs sold by their residents, and since the buyers and sellers of CERs never have any incentive to guarantee that the CER represents real, additional emission reductions, there is reason to be concerned.

A great deal has been written criticizing carbon trading under the CDM. Valid criticisms expose cases where CDM authorities failed to ensure that reductions were additional and without leakage, in which case the failure of the Executive Board to carry out its mandate does puncture holes in the aggregate cap on Annex-1 emissions. However, much criticism of the CDM is not valid. Many critics fail to acknowledge dramatic improvements in monitoring after the first year of the program, including a significant tightening of standards. Many critics wrongly criticize what they consider over or under paying for CERs as undermining global reductions, or as "inefficient," even though the price paid for CERs has no bearing on reductions or efficiency, but only on equity.[3] Critics also fail to acknowledge that trading legitimate credits generates a flow of income from MDCs to LDCs which reduces global inequalities, and trading illegitimate credits generates an even bigger income transfer from North to South. More importantly, critics fail to consider obvious ways to correct the flaws in Kyoto that make carbon trading through the CDM mechanism problematic.

3. Fixing Kyoto

Five simple changes would fix all valid criticisms of Kyoto and make it much more effective and fair. All environmentalists and progressives, including CJ and AC activists calling for system change, would do well to unite to press for these changes at negotiations beginning in Mexico later this year.

[3]Some CJ activists who want to shut down the CDM cite the work of Michael Wara, at the Stanford Program on Energy and Sustainable Development, who strongly criticized the CDM Executive Board certification of CERs for capturing and destroying HFC-23 at refrigerant plants and N_2O at Teflon plants in China in the first year of the program (Wara 2006; Wara and Victor 2008). But Wara's criticism was that MDC buyers paid much more for these CERs than it cost Chinese sellers to make the emission reductions, which Wara incorrectly described as "inefficient." In fact the price paid for CERs has nothing to do with efficiency but only with how the efficiency gain from trade is distributed between buyers and sellers of CERs. It is ironic that CJ activists cite work whose criticism was that too much of the efficiency gain from CER trade went to sellers in LDCs and too little was captured by MDC buyers as reason to shut down the CDM.

(1) Accept the advice of climate scientists on global caps. For a number of reasons we should insist that scientists who study the climate, not economists, are the experts best suited to advise us about how much reduction in global net emissions is necessary. (1) Climate scientists are more likely to be right about the dangers of climate change than economists. (2) The scientific community is miraculously speaking with a single voice once we discount a few scientists who are clearly in the employ of fossil fuel industries, whereas other communities are a cacophony of wildly contradictory advice. (3) The scientific community uses the logic of insurance which is the appropriate methodology when uncertainties are great and the downside risk is literally unthinkable. The alternative logic of cost benefit analysis favored by mainstream environmental economists is ill-suited to climate change where people want to know what reductions are required to make us safe. Weighing costs and benefits is something sensible people do only when they already feel safe. In other words, climate scientists have instinctively used the appropriate methodology whereas economists and politicians have become bogged down in a cost benefit framework which is inappropriate in the case of climate change (Ackerman 2009, 2010). And finally, (4) climate scientists have proven to be the best negotiators for an aggressive response to the danger of climate change. The power of their testimony has now moved reductions of 80 percent or more by 2050 or sooner into the middle of the bargaining table and fixed discussion on the necessity of stabilizing atmospheric concentrations at 350 ppm or less. Nor is this surprising. When tax levels are debated it is economists who are the experts. How high should a tax be? Ask an economist. On the other hand, when we ask how low does a cap on emissions need to be to keep us safe, people sensibly ask climate scientists. Those who want an aggressive response to climate change should want the political debate to play out the second way—with climate scientists telling us what caps make us safe—not the first way—with economists telling us how high to set a carbon tax based on their estimates of how costly the tax will be to the economy. If we change the subject back from caps to taxes we witlessly take the microphone out of the hands of climate scientists and hand it back to mainstream economists.

For decades mainstream economists recommended a minimalist response to climate change based on an inappropriate methodology and large scale models driven by unrealistic and indefensible assumptions, and successfully stonewalled criticisms by any who raised objections (Ackerman et al. 2010a, 2010b; Ackerman et al. 2009; Kahouli-Brahmi 2008; Edenhofer et al. 2006; Laitner et al. 2003). "Expert" testimony from mainstream environmental economists bolstered resistance to dealing with climate change that was orchestrated by denialists, the fossil fuel industry, and the U.S. Chamber of Commerce. Since putting a dollar figure on the damage from cataclysmic climate change is quite difficult, if not impossible, mainstream models traditionally limited their estimate of damages to the case of moderate climate change. In effect, mainstream economic climate models simply left the central issue out of their calculations. Fortunately, climate scientists have recently succeeded in refocusing attention on what has always been the key issue: what is necessary to avoid cataclysmic climate change and keep us reasonably safe.

(2) Caps for all. As explained in section 2, trading CERs between private parties within Annex-1 countries even if they are completely bogus cannot undermine global reductions as long as national, annual emissions are monitored accurately and governments are held to their treaty commitments. Trading carbon credits can puncture holes in the global emissions cap only when sources located in countries where national emissions are not capped sell bogus CERs to sources in Annex-1 countries with caps. The obvious solution is to cap emissions in all countries, i.e. eliminate the distinction between Annex-1 and non-Annex-1 countries altogether. Our motto should be: "*No Cap, No Trade*."

Some CJ and AC spokespeople fail to understand that capping national emissions in all countries would plug all holes in the global emission cap created by trading bogus carbon credits. But others who do understand this object that capping emissions in all countries would not be fair.

They argue it is not fair to cap emissions of poor countries who are least responsible for causing climate change and least able to bear the costs of curtailing climate change. CJ activists, as well as governments in poor countries, argue that capping emissions in poor countries effectively prevents them from developing and catching up with the developed economies.

These arguments against capping emissions in all countries are correct *if the caps are wrong.* However, none of these arguments against capping emissions everywhere holds true if caps are set equitably. Equally restrictive caps for all is grossly unfair. But sensible people, and even sensible governments, understand this.[4]

(3) Equitable caps: The greenhouse development rights framework. One excellent proposal for determining equitable caps for developed and developing countries alike is the Greenhouse Development Rights Framework (GDRF) proposed by Paul Baer, Tom Athanasiou, and Sivan Kartha (2007). They propose a practical formula for assessing countries' "responsibility" and "capability" that addresses an important problem people have raised about international equity. People have pointed out that while more people in LDCs have failed to benefit from successful economic development than in MDCs, nonetheless there are some poor people living in MDCs who also should have a right to benefit from economic development and not have to bear the costs of preventing climate change until they do. Likewise, while there are fewer wealthy people in LDCs than there are in MDCs, there are some wealthy people in LDCs who have enjoyed development and can afford to bear part of the cost of preventing climate change now. The authors of the GDRF propose a practical way to divide those who have already enjoyed the benefits of economic development in any country—and therefore can reasonably be expected to bear the costs of preventing climate change now that we know what kind of problems fossil fuel based development creates—from those who have not yet enjoyed development, and therefore should not be expected to bear the costs of preventing climate change. They go on to create a formula to restrict emissions based *only* on residents who have enjoyed economic development which combines their "responsibility"—their per capita emissions since 1990—and their "capacity"—their per capita GDP—to assign differential caps for all countries on a continuum.

By treating countries differently on a continuous basis, instead of a dichotomous basis as the Kyoto Protocol does by designating countries as either Annex-1 or non-Annex-1, a post-Kyoto international treaty would become much more fair. Not all MDCs are equally responsible and capable. More importantly, not all LDCs are equally responsible and capable. China should not be treated in the same way as the United States when per capita cumulative emissions since 1990 in the United States is 7 times more than in China, and per capita GDP in the United States is 6 times more than in China. However, the Republic of the Congo should not be treated in the same way as China when per capita cumulative emissions since 1990 in China is 50 times more than in the Congo, and per capita GDP in China is 9 times more than in the Congo, as it is under Kyoto. The GDRF formula would give the United States tighter (lower) caps than China, but would give China tighter (lower) caps than the Republic of the Congo. Of course the more we allow developing countries to increase emissions before reaching their caps, the lower caps must be on industrialized countries to meet a given level of global reductions.

Nobody is suggesting that achieving agreement on different caps will be politically easy. But debating the merits of different *formulae* for assigning caps is a far more constructive way to

[4]For equity reasons not all Annex-1 countries were given the same caps under Kyoto. Moreover, in its plan to meet European Union commitments under Kyoto, the EU assigned much lower caps to more developed members like Germany and France, and higher caps to less developed members, including caps that allowed emissions to increase for Portugal and Ireland. Once it is understood that capping everyone does not mean the same cap for everyone, it is apparent that equity can be achieved at the same time that erosion of global emission reductions resulting from failure to cap emissions in all countries is prevented.

organize the discussion than discussing different caps on an *ad hoc* basis. In any case, the answer is simple no matter how difficult negotiations may prove: capping all countries is the only way to guarantee that we will meet our global emissions reduction goal. Capping all countries is also the only way to reap the full efficiency gain possible from carbon trading without risking undermining the overall reduction target when trading bogus credits punctures holes in the global cap. And equity can be achieved by varying the caps for different countries sufficiently using a formula like the one already developed by the authors of the GDRF.

(4) Cap net emissions. Net emissions are what matters with regard to climate change, and surprisingly, as already explained, measuring national annual net emissions is as straightforward as measuring only national annual emissions. Capping net emissions rather than capping only emissions would solve an important problem arising from projects selling offsets for sequestration increases. Under Kyoto if a project increases carbon sequestration it can receive CERs. So creating a tree plantation can qualify for CERs because it is easy to demonstrate that new trees planted are sequestering carbon that would not have been sequestered had the trees not been planted. But at this point Kyoto does not give credit for carbon stored and sequestered by existing forests that are conserved because it is difficult to know whether or not the forest would have been preserved in any case. This creates a perverse incentive to replace existing forests with tree plantations, which gave rise to the REDD proposal discussed below.

Even if we do not take other environmental benefits from forest conservation into account, destroying existing forests is very counterproductive simply from the perspective of net carbon emissions. If the original forest is preserved intact it continues to store large quantities of carbon and also sequesters more carbon each year. On the other hand, if the existing forest is logged off and young trees are planted in its place, net emissions will be higher and occur sooner. The young trees may sequester more carbon than the original forest, but any increase in annual sequestration pales in comparison to the release of carbon that immediately accompanies deforestation. Even if we ignore all the other considerable benefits from forest conservation, from only a narrow, net carbon emission perspective it is almost always better to conserve existing forests than destroy forests even when deforestation is followed by replanting.

But if national annual net emissions were capped, governments would have an incentive to discourage activities that increase net emissions and encourage activities that decrease net emissions within its borders. The international treaty need not dictate to governments how they go about doing this. Since conservation generally yields fewer net emissions than deforestation followed by replanting, national governments would be foolish not to enact domestic policies that make sure that conservation is also financially more attractive. Capping national net emissions provides the proper incentive for governments to find ways to discourage deforestation, eliminates the perverse incentive to destroy and replant that currently exists under Kyoto in countries without caps who can sell sequestration offsets, and rewards sequestration. Moreover, because all that must be measured are annual, national net emissions none of the measurement complications REDD would have to deal with arise. No hypothetical baselines must be constructed, and no complications from the timing and permanence of sequestration increases arise.

(5) A new sheriff for the carbon market. As long as emissions from non-Annex-1 countries are not capped there is no choice but to give an international agency final authority over applications for CERs from sources in those countries. As explained, the applicants have every incentive to cheat and pretend they are reducing emissions even if they are not. More importantly, there is no incentive for non-Annex-1 country governments to blow the whistle on bogus proposals for CERs by home country applicants because there are no negative ramifications for anyone else in the home country since non-Annex-1 country national emissions are not capped. For this reason Kyoto had no choice but to create an international professional bureaucracy to play the role of sheriff for the international carbon market.

But once net emissions are capped in all countries, not only would planned global reductions be secured even if bogus CERs were traded (including bogus CERs for sequestration offsets), the governments of all countries would have a powerful incentive to prevent private parties within their borders from selling bogus CERs in the international carbon market. It is in the interest of country governments whose national net emissions are capped not to certify private parties operating within their territories for more CERs than the additional emission reductions or sequestration increases a project generates, because if they do, either the government or some of its citizens will have to cover the shortfall.

No doubt national governments will appreciate all the assistance they can get from the professional staff of an agency of the international climate treaty with expertise in establishing baselines and measuring additionality and leakage. But replacing the perverse incentive for non-Annex-1 governments to support bogus certification with the socially useful incentive for governments to correctly evaluate applications for CERs would be a big step forward in policing the international carbon market.[5]

4. Common Arguments Against Carbon Trading

4.1 Carbon trading will puncture holes in the global cap on emissions. Hopefully this criticism, which circulates so widely that it is often taken to be an uncontested "fact" in some circles, has been laid to rest. As explained, *only* when the CDM Executive Board awards *illegitimate* credits for projects in countries *without* caps are holes punctured in the cap on aggregate emissions from all Annex-1 countries, and the effectiveness of the treaty weakened. This problem under Kyoto has been overexaggerated, but can be eliminated entirely by capping emissions in all countries.

4.2 Carbon trading will aggravate global inequalities. If expansion of free market international trade and investment aggravates global inequalities, why would an international carbon market be any different? This concern deserves a careful answer.

When there are differences in the true opportunity costs of producing goods in MDCs and LDCs, there are potential efficiency gains from specialization and trade. In this case the terms of trade divide the efficiency gain between the countries. When loans lead to larger increases in productivity in LDCs than MDCs, international lending yields an efficiency gain. In this case the interest rate on international loans divides the efficiency gain between LDC borrowers and MDC lenders. The problem in the case of international trade and investment is that as long as capital is scarce globally, the interest rates and terms of trade that the laws of supply and demand generate predictably distribute the lion's share of the efficiency gains from international trade and investment to the MDCs who have higher capital/labor ratios, and thereby widen the gap between the haves and have-nots. Moreover empirical evidence about the effects of trade and capital liberalization over the past thirty years on global inequality strongly support what theory predicts: expansion of free market international trade and investment systematically aggravates global inequalities and inequities (Hahnel 1999: appendix B; Hahnel 2005b). But as long as MDCs have tighter emission caps than LDCs, the situation is reversed in international carbon markets.

Under Kyoto only MDCs have mandatory caps, which means that only MDCs are compelled to bear *any* of the costs of averting climate change. If MDCs are forced to make all their reductions domestically this will cost them more than if they can buy some of their reductions from sources in LDCs for less than it would cost them to make those reductions themselves, which is why sources in MDCs who will have to make reductions lobby for this option. But whether it

[5]To be clear, once net emissions are capped in all countries, failure to award CER credits correctly can no longer puncture holes in the global cap. But since bogus certification creates injustice within countries, and inefficiencies in where abatement is located globally, it is still important to minimize.

costs them more or less, it is sources in MDCs who bear *all* of the costs of averting climate change under Kyoto.

Without trading the costs to MDCs are higher and LDCs have no opportunity to gain financially from trading. Of course LDCs and MDCs will all benefit from averting climate change with or without trading, but without trading LDCs will enjoy no additional financial benefits from Kyoto. However, when sources in LDCs are allowed to sell credits to sources in MDCs, they enjoy a substantial, additional financial gain because they only sell credits for a price higher than their cost of producing the reduction.

The economics is simple: since many of the cheapest abatement opportunities are located in LDCs, there is an efficiency gain from reducing emissions there rather than in MDCs. When a source in an MDC responsible for a reduction buys a CER from a source in a LDC, the seller and buyer share the efficiency gain. The higher the price paid for the CER the more of the efficiency gain from locating the reduction where it is cheaper is captured by the seller in the LDC. The lower the price of the CER the more of the efficiency gain is captured by the buyer in the MDC.

Under Kyoto LDCs get the benefit of averting climate change at no cost to them with or without carbon trading. Without carbon trading that is all they get. But with carbon trading LDCs get an additional financial gain from capturing part of the reduction in costs to MDCs that carbon trading creates. When LDCs and MDCs sit down to play the game of divide the efficiency gain from carbon trading between them, under Kyoto the MDCs have already put up all the chips they are playing for. Even if MDCs re-capture most of their chips, any MDC chips that LDCs capture when they sell CERs puts them that much further ahead than they would have been had they never had the opportunity to sit down at the carbon market gaming table and play with what is in effect "house money" provided by the MDCs. In a post-Kyoto treaty, if caps were set according to the GDRF formula, this would remain the case for any country whose cap exceeds its current emissions. And even in later years, when caps are eventually set below current emissions for LDCs, countries with more lenient caps will continue to enjoy the same kind of advantage *vis a vis* countries with tighter caps in carbon trading that countries with higher capital/labor ratios enjoy *vis a vis* countries with lower capital/labor ratios in international lending and trading. In general it is the unequal assets traders come to a market with that generate inequitable outcomes even when markets are competitive. As long as LDCs have higher caps than MDCs they have the "asset advantage" when trading in carbon markets.

4.3 Wall Street will turn carbon trading into the next financial crisis. Many now worry that if we turn emission rights into a commodity, Wall Street will integrate CERs into its next toxic, financial soup, and this will lead to yet another financial crisis.

There are only two ways to prevent the financial industry from ripping off sizable chunks of economic output while creating conditions that give rise to financial crises. The best way is to declare the entire financial industry too important to be allowed to fail repeatedly, and replace private with public finance. A public financial sector would not only be virtually immune from crisis, it could do a much better job of channeling savings into productive investments rather than asset bubbles; investments that lead to better products and technologies; investments that increase our physical, human, and natural capital; investments to make our economy carbon neutral before it is too late: in other words, the kinds of investment we really need.

The only other way to protect the rest of us from Wall Street excesses is to break up financial institutions that are too big to be permitted to fail and subject their various parts to regulations that are appropriate and competent. This is a second-best policy because, as history has just demonstrated once again: (1) the financial industry is very adept at finding ways around existing regulations. (2) The financial sector will relentlessly lobby politicians to remove and relax regulations, and even when financial industry profits are less bloated it will always have sizable resources to devote to such efforts. (3) There is little reason to believe that in private hands the financial sector,

even if competently regulated, would steer investments as aggressively into the kinds of projects desperately needed at this critical juncture in history when we need to convert our economies to carbon neutrality ASAP as a public credit system could.

If we replace private with public finance, or subject private finance to competent regulation, we need not fear that carbon allowances will become part of the next toxic financial soup in either case. Moreover, if we fail to tame finance in one of these two ways, it is almost certain there will be more financial toxic soups and crises, whether or not carbon allowances are one of its ingredients. In other words, we cannot prevent future financial crises by refusing to create certified emission reduction credits. Future financial crises can only be prevented by successful financial reform.

However, consider a worst case scenario. Suppose we create a global market for carbon allowances and offsets that grows to become quite large. Suppose financial regulatory reform never happens. Suppose Wall Street does create a horrible cocktail of subsidiary markets around the carbon market including carbon futures markets, markets for carbon swaps, derivatives based on fluctuations in the price of carbon and carbon swaps, and whatever new financial "innovation" Wall Street comes up with next. Suppose all these carbon futures, swaps, derivatives, etc. are packaged together with opaque securitized financial instruments based on other commodities that nobody understands, but eventually everyone comes to mistrust. In other words, suppose Wall Street mixes carbon allowances into a terrible toxic financial potion, and suppose this new asset bubble does burst with a vengeance.

This would be terrible indeed. And if the financial crash were worse than the one that just occurred it would lead to even more terrible consequences for all of us who live on Main Street. But this is the important point. The financial collapse would not diminish the reduction in global carbon emissions one iota. Fluctuations in the price of carbon allowances and any derivatives based on those prices would redistribute income and wealth in mostly undesirable ways. And the price volatility for allowances that results would fail to send the steady and reliable price signal for carbon emissions desired. But as long as national treaty obligations were enforced, and as long as domestic laws requiring those who emit carbon to have the appropriate number of permits were enforced, the effort to reduce emissions and avert climate change would not be undermined one iota.

In this worst case scenario what would happen is Wall Street would siphon off a big chunk of world product, first by trading in toxic assets that include carbon allowances as a bubble built, and then by shifting the cost of the financial clean-up onto the rest of us. But this has nothing to do with the number of emission permits in existence, and therefore nothing to do with how much carbon can be emitted. Moreover, the financial crisis is not the fault of the carbon market. This tragedy would be due entirely to the failure to either nationalize or subject the financial sector to competent regulation. It is highly implausible that denying Wall Street access to one new commodity, carbon allowances, would prevent future financial crises if the financial industry remains free from competent regulation.

4.4 Carbon trading reduces pressure on MDCs to undergo necessary changes. Critics charge that carbon trading is a loophole permitting MDCs to weasel out of making necessary adjustments to their carbon guzzling domestic economies and unsustainable life styles. These critics argue that we need to put maximum pressure on MDCs—where carbon emissions per capita are highest and therefore conversion to carbon neutrality is most urgent—to replace fossil fuels with renewables and develop new energy saving habits of consumption. They argue that preventing MDCs from trading increases pressure for them to change, whereas allowing them to buy foreign credits enables them to postpone necessary domestic transformations.

It is true that we want to put maximum pressure on the advanced economies to change their unsustainable economic way of life. It is true that climate change will not be averted unless energy,

transportation, agricultural, and industrial sectors in MDCs are completely transformed and consumption patterns are far more energy efficient. It is true that the sooner these and other monumental tasks are tackled by MDCs the better our chances of avoiding catastrophic climate change will be. And it is also true that Kyoto has failed to launch the advanced economies on this path. But banning carbon trading is not the right way to put pressure on MDCs. *The way to increase the pressure is to lower MDC caps*, not to make it unnecessarily difficult for them to meet their caps, which is what bans on trading do.

In the end MDC governments will have to regulate, tax, or cap, as well as spend massive sums on economic conversion. The way to force them to launch an all-out "Green New Deal" is to lower their national caps dramatically in the international treaty that will follow Kyoto in 2012, while simultaneously making it as cheap as possible for them to meet lower caps by allowing full carbon trading. Moreover, since trading makes reductions easier, it increases the likelihood of winning the crucial political battles that lie ahead to lower caps even more than what can be won today. Restricting or banning trading only gets us less emission reduction for our pain.

Another way to see it is this: why should we prevent fruit growers from picking low hanging fruit when it is available, and instead force them to pass over low hanging fruit and pick fruit from higher branches? If we want to force fruit growers to pick *both* the low hanging *and* the high hanging fruit we can accomplish this by increasing the amount of fruit we require them to pick. But there is never any useful purpose served by forcing fruit growers to pass over low hanging fruit and pick fruit from high branches only. If we want to force fossil fuel burning utilities in MDCs to undergo major, costly conversion, the way to do this is to lower the emission caps on MDC countries so they will have to buy not only the cheaper allowances but also undertake more costly conversions of their own plants.

4.5 REDD dispossesses indigenous communities. Critics attack a new proposal called Reducing Emissions from Deforestation and Degradation, or REDD, because they claim it dispossesses indigenous peoples and forest communities. The need to provide positive incentives to protect forests was first raised by the Coalition of Rainforest Nations in 2005. Recently it has generated wider interest because new estimates are that carbon emissions from deforestation and forest degradation account for 20 to 25 percent of global emissions, which is more than the entire global transportation industry! The REDD proposal hammered out at negotiations in Bali in 2007 became a casualty of the train wreck in Copenhagen where it was never put to a vote.

REDD is an attempt to correct for a perverse incentive created by the Kyoto Protocol as originally negotiated to destroy existing forests in non-Annex-1 countries. As already explained, because national emissions are not capped in non-Annex-1 countries, and because there is no payment for on-going carbon storage and sequestration services, Kyoto provides no incentive to protect forests from being burned off to create pasture land for cattle, or from being cut down to sell timber even though deforestation releases large amounts of carbon. On the other hand, the CDM mechanism creates a positive incentive to plant trees after deforestation to sell as sequestration offsets since these projects can demonstrate additional sequestration and thereby qualify for certification. The perverse temptation to destroy forests for commercial benefit, and then replant to sell sequestration offsets, is obvious.

REDD was proposed to eliminate this perverse incentive by allowing the CDM Executive Board to award credits for preserving threatened forests. Of course determining if a forest is threatened requires establishing a business-as-usual base-line, which as we have seen is not easy. And capping emissions in non-Annex-1 countries as proposed in section 3 would be a simpler way to discourage deforestation and reward sequestration without creating difficult measurement problems. Nonetheless, for the first time REDD could make protecting existing forests in LDCs financially valuable, and thereby make control over existing forests more valuable than before. And that is the catch, according to CJ critics. REDD would give global corporations and landed

aristocracies in LDCs an incentive to dispossess forest people and grab land titles even if they did not want to search for minerals or oil there, and even if they were not yet ready to burn the forest to make pasture land, or log it off for timber sales.

Historically, when oil or minerals are discovered on native lands, dispossession has often been the result. And even when native people retain possession of their lands, traditional ways of life are often destroyed by the activity necessary to reap financial rewards from new resource extraction opportunities. By design REDD does make forests inhabited by indigenous peoples more valuable. But in this case, if forest dwellers can retain possession of their lands they can reap financial rewards without destroying the forests and upsetting their traditional ways of life in any way. REDD rewards forest people financially for maintaining their traditional ways of life because forest conservation provides valuable benefits for the rest of us. All forest people have to do is avoid expulsion by global "sharpies." Perhaps CJ activists and advocates for the rights and well-being of indigenous people should concentrate their efforts on helping forest dwellers keep their lands instead of denouncing an international program willing to pay them for continuing to live exactly as they prefer.

This article has been primarily concerned with international carbon trading. However, since many who oppose a cap and trade treaty offer an international carbon tax as an alternative, I briefly examine why this would not be advisable before concluding.

5. Why Cap and Trade Instead of an International Carbon Tax?

The train wreck in Copenhagen has caused some to ask whether it might not be advisable to abandon the Kyoto framework altogether and try to get countries to agree on an international carbon tax instead. In early negotiations there was support for an international carbon tax, particularly from Europe. Moreover, the cap and trade framework hammered out in Kyoto was championed principally by Al Gore and the United States, which remains the only country not to sign the Kyoto Protocol, and the country least likely to sign a post-Kyoto treaty. Finally, progressive economists, including the author of this article, traditionally favor taxes over cap and trade programs for a number of good reasons: (1) a tax is simpler and easier to administer. (2) With a tax there is no carbon market to go haywire. (3) With a tax the government collects the revenue automatically, whereas with a cap and trade policy progressives must always fight to make sure that 100 percent of the permits are sold at auction so the government gets the revenue instead of giving away the new wealth the cap creates to polluters. Therefore, a carbon tax is usually preferable to a cap and trade policy that achieves the same overall reductions. So why should progressives not abandon the Kyoto cap and trade framework as a failed experiment and push for an international carbon tax in its place? There are three reasons why this would be a tragic mistake.

Most obviously, the international community has invested twelve years negotiating a cap and trade format, and given the urgency of the problem as compared to the speed of international diplomacy we should not want to start all over again. While some propose now switching from cap and trade to an international carbon tax in good faith, those who have long opposed doing anything significant to avert climate change now dangle a carbon tax in front of our noses as a cynical ploy to delay and eventually derail negotiations. Those who want a serious and timely response to climate change should be wary of witlessly aiding and abetting those maneuvering for further delays.

More importantly, for reasons already explained the scientific community has positioned us to win global caps that are, even if not a "solution," a decent deal. Debate is now centered on caps that stabilize greenhouse gas concentrations in the atmosphere at 350 ppm or less, which would limit the rise in the average global temperature to 2 degrees Celsius or less. Caps that accomplish

this would be a tremendous step forward to prevent climate change before it is too late. On the other hand, nobody believes we have any chance of winning political support for an international carbon tax high enough to reduce emissions by nearly this much. As explained in section 3, environmentalists should not witlessly take the microphone out of the hands of climate scientists and give it back to mainstream economists by changing the subject from how low caps must be to keep us safe back to how high a carbon tax should be in light of reduction costs.

But neither of these is the most important reason progressives should prefer a cap and trade treaty to an international carbon tax. The most compelling reason is there is no practical way to make an international carbon tax nearly as fair as we can make a cap and trade treaty. A global carbon tax places a more or less equal burden on all countries, principally in the form of higher energy costs in the short and medium run. *If* the international treaty organization collected this tax from every country, then *in theory* the treaty organization could rebate the tax revenue in a way to be fair to poorer countries, e.g. compensate China and the Republic of the Congo for imposing as high a carbon tax as the United States. But there is no chance that countries are going to let the United Nations collect a carbon tax. The only conceivable carbon tax treaty would require all governments to impose a uniform carbon tax, and then every government would collect the tax from its own corporations and citizens. Having done so, does anyone imagine the U.S. Senate would agree to send tens, if not hundreds of billions of dollars per year collected from U.S. corporations and citizens to the government of China?

So, the overwhelming problem with an international carbon tax is there is no way the tax revenues would be distributed back to countries in a way that fairly compensates poorer countries. On the other hand, as explained, with cap and trade redistribution is done by giving wealthier countries tighter (lower) caps than poorer countries, and then allowing richer countries to "buy" cap space from the poorer countries through carbon trading. Kyoto has started us on this path, and distributing national caps on a continuum based on differential responsibilities and capabilities as the authors of the GDRF suggest is the best chance to advance the cause of international justice in the future. There is no chance of moving the climate justice agenda forward if we go back to the idea of an international carbon tax.

6. Conclusion: Climate Change and System Change

It is important to distinguish between CJ criticisms of global capitalism as the fundamental cause of climate change, and AC calls for "system change"—both of which are justified—from CJ and AC criticisms of the Kyoto Protocol and carbon trading—which for the most part are not. The author of this article has been arguing the case for economic system change and helping explain why the environment will not be safe until the economics of competition and greed is replaced by the economics of equitable cooperation for over thirty years (Albert and Hahnel 1979, 1981a, 1981b, 1991a, 1991b,1992a, 1992b, 2002; Hahnel 1999, 2002, 2005a, 2007a, 2007b, 2008, 2009; Hahnel and Sheeran 2009). However, because our preferred solutions cannot always be achieved immediately, those of us who argue for system change often support and join campaigns to improve outcomes in the meantime.

Just as it makes sense for those of us who call for the end of wage slavery to support workers fighting for wage increases under capitalism, it also makes sense for those of us who call for the replacement of capitalism with some form of participatory eco-socialism to join campaigns for the most fair and effective way to avert climate change while capitalism persists. Our "new world" is both desirable and possible, but because it requires support from a substantial majority of the population it is unrealistic to pretend it is just around the corner. Unfortunately, responding to climate change cannot wait for system change. This article has argued that right now only

an improved cap and trade treaty can help avert climate change effectively and fairly before it is too late.

To improve upon the positive start Kyoto has provided we need to: (1) embrace the advice of climate scientists and lower the global cap on emissions sufficiently to stabilize atmospheric concentrations of greenhouse gases at 350 ppm and keep the average increase in global temperature below 2 degrees Celsuis. (2) Cap emissions in all countries. Once we do these two things we will be assured (a) the treaty is *effective*, i.e. it really will reduce the risk of cataclysmic climate change to an acceptable level, and (b) even if bogus carbon credits are traded this will not puncture holes in the global emission cap. (3) Set national caps using a formula along the lines of the GDRF proposal which accounts for differential responsibility and capability on a continuous basis and allows LDCs sufficient emission rights for them to develop. Once we have done this (a) we will have distributed the costs of averting climate change fairly and not denied anyone, living anywhere, the right to benefit from economic development, and (b) carbon trading will generate a massive annual flow of income from richer to poorer countries without resort to acrimonious debates over climate reparation payments unlikely to lead anywhere. (4) Cap national net emissions rather than emissions. This will eliminate existing perverse incentives and provide positive incentives for carbon storage and sequestration. And (5) make national governments the new sheriff in charge of awarding CERs for projects within their territories. While this does not make the difficult job of judging additionality and leakage any easier, it protects the integrity of the treaty in any case, and puts the decision in the hands of a sheriff who must answer to those who are harmed—country nationals—if sellers receive more CER credits for a project than they deserve.

It is not inconsistent to fight for these policies now while calling and organizing for system change as well. Ill-informed criticisms of carbon trading by CJ and AC spokespersons only serve to undermine critical efforts to do what must be done to avert climate change in the here and now.

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Bio

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