

Climate Shopping: Putting the atmosphere up for sale

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Climate Shopping: Putting the Atmosphere Up for Sale

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John Byrne
University of Delaware

Leigh Glover
University of Delaware

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Abstract

PAGE

I

The atmosphere is being transformed from a commons to a commodity.

The atmosphere is being transformed from a commons, where it is available for all in perpetuity, to a commodity whose usefulness for storing waste is to be allocated and traded among nations. Three groups are playing major roles in the debate over this transformation: science, business, and governments. Their participation in and impact on these global negotiations to govern the sky is examined in an effort to explain the emerging consensus in favour of an atmospheric commodity system. An alternative approach relying on principles of social equity and ecological sustainability is then proposed as a means to reclaim our atmospheric commons. Environmental non-government organizations commonly emphasize principles such as those in our proposal. Some members of the scientific, business and governmental communities have also voiced support for a new policy direction. Our arguments are intended to support efforts in these sectors to conceive an alternative policy paradigm.

An alternative approach is needed which relies on principles of social equity and ecological sustainability.

Because our criticisms challenge current tendencies to rely primarily on economic instruments, such as tradeable emission permits, to address the climate change problem, some may construe our position as opposing market-oriented policies of any kind. This is not correct. Incentive-based policies such as emissions trading can play an important part in tackling the climate change problem, if they are employed in an international framework with clear commitments to sustainability and equity. Our objection to the current approach is that it lacks a commitment to sustainability commensurate with the finding of the United Nations sponsored Intergovernmental Panel on Climate Change which has established from scientific evidence the need for a 60% or greater reduction in global greenhouse gas emissions. Additionally, our concern is that the current approach has failed to consider the dilemmas of inequality, historically accompanying market regimes.

Economic instruments can make a valuable contribution if employed in an international framework committed to sustainability and social equity.

1. Managing the Atmosphere

International efforts to address the prospect of climate change are centered on negotiations to implement the United Nations Framework Convention on Climate Change (hereinafter referred to as the UN Framework Convention). Three sets of interests are shaping these negotiations – those of science, business, and government. Their interactions are jointly conceiving and creating a *nature-society regime*¹ which will govern human and non-human futures alike in profound ways (including some we surely cannot now fully grasp).

With the UN Framework Convention having entered into force after the 1992 Earth Summit, international negotiators are focusing their attention on its implementation, a process that occurs primarily through the annual Conferences of the Parties (COP). This process is being shaped by a political dynamic involving the interests of science, industry, and nation-states. Initially, communications from these interests presented a confusing picture of the extent of the problem of climate change. This was exploited by some sceptical scientists, but especially by industry lobbyists and pro-business politicians in the industrialized countries, to discredit claims of global warming from the build-up of so-called ‘greenhouse gases.’² An apparent shift has taken place, however, wherein the bulk of the scientific community, the majority of nation-states, and a growing number of business leaders have concluded that at least some level of restriction to the emission of carbon dioxide (or CO₂) and other greenhouse gases is needed.

The Kyoto Protocol (hammered out in December 1997 at COP-3) sets binding emission targets for Annex I nations (the countries of North America and Europe, and Japan, Australia, and New Zealand).³ As a group, Annex I countries are to reduce their collective greenhouse gas emissions 5% below 1990 levels. This collective reduction is to be achieved between the years 2008 and 2012. Such a decrease amounts to only a small contribution towards the 60% reduction estimated by the UN-sponsored Intergovernmental Panel on Climate Change (hereinafter referred to as IPCC) as needed to stabilize atmospheric concentrations of greenhouse gases (IPCC, 1990).

At COP-4 in Buenos Aires and COP-5 in Bonn, great attention was given to a range of policy instruments (called “flexibility mechanisms” in the Kyoto Protocol) that would assist developed countries in lowering emissions. The agenda for COP-6, being held in the Hague in November 2000, is likewise focused on these policies. The focus on market-style policies is partially a response to the failures of most developed nations in the initial round to effectively lower emissions by voluntary measures. The COP meetings have mainly focused on realizing low-cost abatement options by allowing wealthy nations to trade with Eastern European and other less well-off members of Annex I for the opportunity to slow emissions growth among the latter (through technology transfer). The Kyoto Protocol instruments are based on creating

a new market to manage atmospheric emissions. In effect, under the auspices of the UN, an atmospheric commodity system is being established.

This emerging market system contains design features contributed by science, governments, and industries that operate increasingly at the global scale. Each of these interests has its own peculiarities and entry points into the climate change debate, as discussed below. Importantly, though, the interactions among these three interests have contributed to a tendency to think about the problem of global warming and its resolution in a distinctly commercial manner. Consensus managers, drawn from science, government, and industry, speak on behalf of the broad agreements reached so far, which include: 1.) the recognition of climate change as a complex physical phenomenon for which sustained scientific investigation is needed; 2.) an acceptance that enough evidence exists to justify global response strategies; and 3.) a view that policy should aim to manage emission changes in a cost-effective manner with modest, practical goals used to build widespread support.

Three sets of interests are shaping climate change negotiations – those of science, business and government.

A precautionary philosophy is promoted in which science and industry work with nation-states in a democratic forum to reduce global risk in a rational, measured manner.⁴ The achievement of sensible results hinges upon the enactment and implementation of a policy which allows industries and individual states the flexibility to search for sensible solutions through market-style trading mechanisms. If designed properly, many leaders of the science-government-industry consensus believe that global policy can constitute the atmosphere as a well-managed environmental property sustained in the interest of present and future generations, an idea broadly consistent with the environment-development arguments promoted by the Brundtland Commission.⁵

We find the emerging consensus less than convincing on ecological and social grounds. Below we offer an analysis of its roots and evolution.

2. Scientific discourse – the rise and retreat of epistemic politics (the political role of science)

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It is widely agreed that the vigilant efforts of science are bringing the ecological problems of modern life to the world's attention. Contributions by many in science to extend our knowledge of climate change have clearly been motivated by an abiding concern for the state of our ecological endowment.

Scientific research has allowed us to understand ever more precisely how human activity is affecting the natural environment. For example, through a database built by international scientific cooperation – the Global Environmental Monitoring System – we have learned that industrialization has changed the chemistry of the lower atmosphere throughout much of the world. Industrial pollutants such as sulphur dioxide (SO₂) and total suspended particulate (TSP), now routinely appear in concentrations in the world's major cities which are well above health standards set by the World Health Organization (see Figures 1 and 2). In the U.S., continuous studies of the lower atmosphere of the continental portion of the country by its Environmental Protection Agency have revealed that only a tiny portion of this airshed can normally be regarded as free of industrial pollution (Figure 3).

The requirement for developed countries to reduce their emissions 5% below 1990 levels is only a small contribution towards the 60% reduction needed.

Sponsored by two UN science agencies – the United Nations Environment Program and the World Meteorological Organization, the IPCC was formed in 1988 to investigate the possibility that anthropogenic (or human-caused) emissions of carbon dioxide and other heat-trapping gases may actually force a new, warmer climate in the 21st century. The IPCC now estimates that dramatic reductions in greenhouse gases will be needed to stabilize the climate system without human-induced warming (Figure 4).

Early efforts by the IPCC to identify the potential impacts of climate change revealed the immensity of such a research task, the paucity of original and relevant research that had been completed, and the uncertainties of the potential impacts. National policymakers, seeking clear conclusions about the potential risks of climate change, were disappointed with the apparent ambivalence of the IPCC's first major report in 1992. Possibly in an attempt to avoid the sensationalism of the apocalyptic visions being promoted by some environmental

groups, the IPCC adopted a cautious tone in its report to the UN. This was seized upon by the fossil fuel industry lobbies and some in the Annex I bloc to argue against aggressive responses to the climate change issue. Its subsequent 1996 report left less doubt about the scientific evidence of climate change and human involvement in contributing to the warming trend.

But even with its stronger language on human sources of climate influence, the IPCC's second effort eventually suffered a similar political fate, creating more controversy than clarity on the need for world action. In the case of the second assessment report, the IPCC's troubles arose from the question of policy strategy. In order to respond to the challenge of identifying solutions to the climate change problem, the IPCC decided in 1992 to create a third Working Group (WG III) composed largely of economists who would synthesize the research throughout the world on the social and environmental costs and benefits of different strategies to avert climate change. This group was to advise the international community about policies to address the problem.

Scientific research has allowed us to understand ever more precisely how human activity is affecting the natural environment.

Meeting in Berlin prior to COP-3, Working Group III's technical staff reported on its survey of policy mechanisms, concluding that it could be very costly for the world, no less than for OECD countries, to require significant reductions in emissions by the Annex I group. If the OECD were forced to cut greenhouse gas releases, the economists argued, world economic growth might slow and everyone could be made worse off. As an alternative, the WG III staff offered an emissions trading strategy in which the Annex I bloc would be allowed to help transition economies in Eastern Europe and developing countries to reduce their greenhouse gas emissions and count such reductions against the emissions tally of Annex I members.

If the IPCC expected that such findings would be accepted in the global community without complaint, they were in error. Critics, especially from developing countries, were quick to describe the proposal as a form of "environmental colonialism" (Agarwal and Narain, 1993), challenging a core premise of economics that an efficient solution was an "objective" one.

The storm of protest which greeted the WG III draft exposed an underlying Western political bias not only in economic thinking, but in the IPCC's work generally.

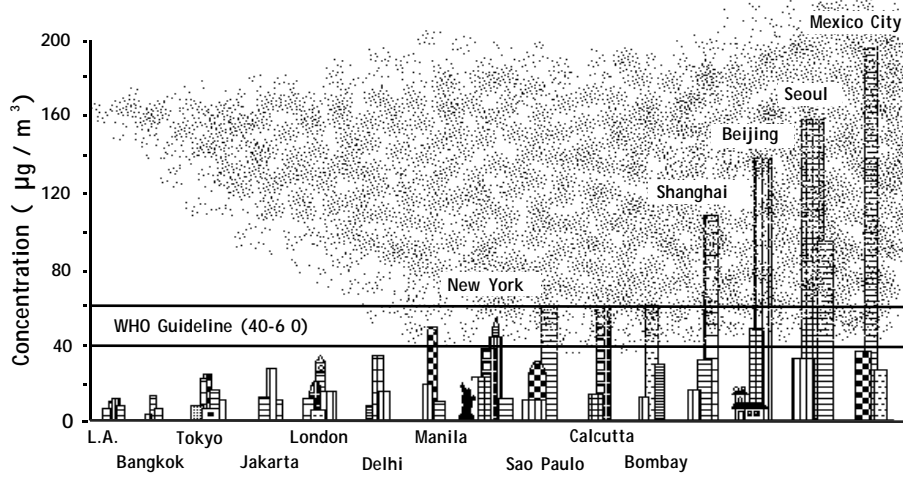
In the full range of its efforts, the IPCC, as a scientific body, had assumed that its evidentiary findings and, eventually, its detailed process map of climate change impact and human response, would form the objective basis for establishment of a management regime to guide world efforts away from what had become essentially an uncontrolled experiment with the atmosphere. This presumption casts science in the role of objective arbiter, a standard Western mantra for the resolution of difficult, conflict-ridden problems. But it hardly leads to consensus in the wider world of politics where science is far more sceptically received and judged.

As Redclift has noted on the role of the science in the global warming debate, the suggestion that "... increasing our knowledge about future climate change and its impacts will enable us to adopt more appropriate values, emphasizing long-run sustainability over short-run economic gain" is based on wishful rather than systematic thinking (1995: 15). Indeed, the climate change case appears well suited to illustrate the political over-simplification of much of the scientific debate.

The climate change debate illustrates the political over-simplification of much of the scientific debate.

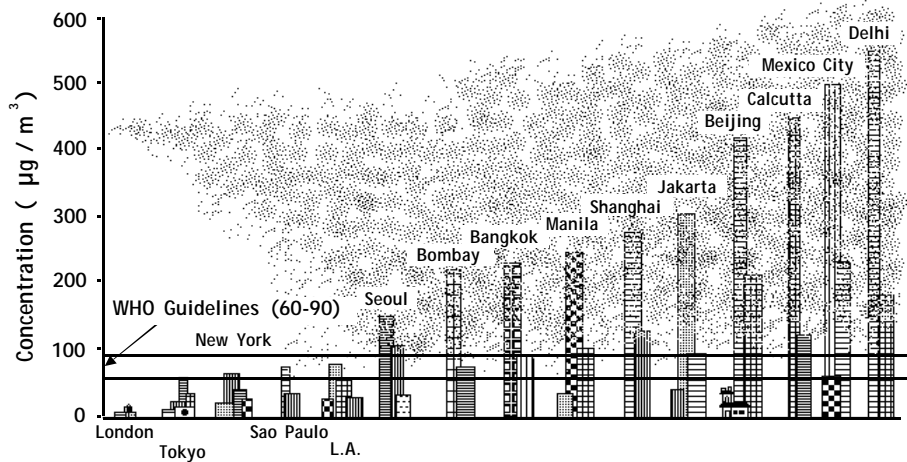
While science should be given full credit for discovering the problem, the "knowledge-based community"⁶ turns out, again, to have been outmanoeuvred, politically. As a result, the IPCC has repaired to the safer confines of debate about the causes and consequences of global warming, leaving the particulars of collective action to the politicians. Two things can be confidently predicted about this retreat: first, science will bemoan the failure of the world to listen to it, rather than politics and economics; and second, many in the scientific community will continue to believe that, unavoidably, one day they will be recruited as global managers to clean up the mess – if it's not too late. Many in this community have yet to understand that presenting the scientific evidence cannot, by itself, bring about necessary political and economic change. Some also fail to recognize the objections of developing countries and others to the presumption that applying Western scientific management techniques is an 'objective' thing to do from the point of view of all parties.

Figure 1: SO₂ Pollution in the World's 15 Megacities



Source: WHO and UNEP. 1992. *Urban Air Pollution in Megacities of the World*. Cambridge, MA: Blackwell Reference (Published on behalf of World Health Organization and United Nations Environment Programme).

Figure 2: Total Suspended Particulate Pollution in the World's 15 Megacities



Source: WHO and UNEP. 1992. *Urban Air Pollution in Megacities of the World*. Cambridge, MA: Blackwell Reference (Published on behalf of World Health Organization and United Nations Environment Programme).

Source: U.S. National Park Service monitoring station data

Figure 3: The Last Reservoir of Clean Air in the U.S.



Figure 4: IPCC Estimates of Reductions in Anthropogenic Emissions Needed to Stabilize Atmospheric Concentrations at Current Levels

Source: IPCC. 1996. *The IPCC Second Assessment Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the UN Framework Convention on Climate Change*. New York, NY: United Nations Environment Program; Geneva, Switzerland: World Meteorological Organization.

Greenhouse Gases	Reduction Required
Carbon Dioxide (CO ₂)	> 60%
Methane (CH ₄)	8 - 20%
Nitrous Oxide (N ₂ O)	70 - 80%
CFC-11	70 - 75%
CFC-12	75 - 85%
HCFC-22	40 - 50%

3. Democracy to the rescue

Given science's limitations in influencing the politics of climate change, some have championed the notion that a dose of democracy should be able to deliver a better result. But engaging political forces on behalf of a global problem in a world of nation-states is fraught with challenges. Just as corporations would not be expected in the modern era to alter their ways in response to any merely moral responsibility posed by their release of greenhouse gases, clearly few nations can be relied upon to voluntarily respond to the risk of climate change. A form of global governance is necessary for this most global of problems. Imperative to such governance is the need to fulfill both a symbolic function as well as an operational one. It is interesting to note how democracy is being globalised in this regard.

A form of global governance is necessary
for this most global of problems.

Climate change negotiations are fast creating an archetype of global democracy with four defining features:

- *Techno-economic Governance*: Negotiations are conducted via world forums (the COP process) with appropriate 'technical groups' assisting in the preparation of conference agendas and in post-conference spinning of the results. In this regard, democratic results – the voting out of protocols, such as the one at Kyoto – are to a significant degree a creation of expert discussions which shape the agenda of negotiations, and 'behind-the-scenes' negotiations of economic elites which define the parameters of 'acceptable' and 'practical' solutions.
- *Neoliberal Ideology*: Through a blend of American liberalism and European social democratic ideology, and neoconservative emphasis on market-friendly policy making, global governance is increasingly conceived as a problem-solving exercise. A core expectation in the case of environmental conflicts is that solutions will depend, at least in part, on acceptance by the wealthy North of its responsibility on behalf of the world to do good. The mechanism for delivering 'good' on a global scale is seen by Northern states as the market system.
- *Operational Democracy*: Proof of the democratic character of the process is found in the open discussion, even dissent, in which nations engage during global negotiations.

In this respect, democracy is seen as an artifact of political expression – it is a symbolic state which gives authenticity to whatever outcome is realized, so long as there is vigorous debate. Outcomes, even if they are unreflective of the level of action needed to really solve a problem, are nevertheless presumed to be democratic because they are the result of open debate.

- *Virtual Solutions:* In a hyper-symbolic age such as ours, providing an appearance of solving the problem is seemingly as important as actually solving it. In the case of climate change, a significant effort is being made to devise appropriate symbols and signs of a ‘solution’. Much of this symbolism is focused around world conferences and high-level negotiation summits, with the special skills of the high-tech media enlisted to stage events and transmit messages globally. The measure of success of such global extravaganzas is whether they convey a sense of serious, even urgent, but sensible action is being taken. In other words, the *spectacle* of world action needs to be communicated in order for the spectators to be persuaded that they are being well-served and problems are being solved. Never mind if the ‘solutions’ don’t quite fit the size of the problem – yes, a 60% reduction or more in emissions is needed, and we are only reducing to 5%, but we are working on it.

No one believes that the Kyoto negotiations averted the threat of climate change.

From its beginnings at Rio to the full-fledged COP negotiations, the climate change debate has been honed and refined to meet the demands of virtual democracy. An apparatus of considerable complexity and size has developed within this regime, involving technical/scientific, economic, financial, and organizational functions – virtual democracy doesn’t come small. Yet, while it is still in its formative years, virtual democracy can already claim certain achievements.

- All committees of world conferences on climate change have Third World representatives and conveners are routinely from the Third World, as well;
- All technical advisory units likewise have Southern representation;

- All major decisions follow a pattern of global democratic deliberation: a) in open (public) session, the North is pummeled by the South for causing the problem and the North's more liberal leaders accept this verdict; b) in closed session, Northerners meet amongst themselves and decide what they are willing to do; and c) in final session, the international media report on the results of the heated dissent and conflict that led to a global compromise.

One positive sign of democracy at work has been the influence of environmental non-government organisations (NGOs).

Virtual democracy is highly choreographed and the spectacle of action is its political product. Indeed, the Kyoto Protocol is an exhibit of the triumph of democratic spectacle over substance. No one believes that the Kyoto negotiations averted the threat of climate change. And no one believes that the 'dissent' at the negotiations actually affected the outcome. Instead, global democracy's triumph at Kyoto was to deliver the message that "we are serious about this problem ... sort of."

One positive sign of old-fashioned, non-virtual democracy at work has been the influence of environmental non-government organisations (NGOs). Increasingly, it seems, we will need to rely on NGOs to keep climate change negotiations honest.

4. The search for an atmospheric commodity system

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With science bruised by its brush with *realpolitik*, and virtual democracy intoxicated with its own symbols, a third interest – that of business – has been quick (and eager) to fill the void with its suggestions. Its proponents do not speak in a single voice. There are those corporations with vested interests in the conventional energy system that aggressively seek to discredit climate change science, downplay potential climate impacts, evoke nationalist suspicions of global interference with sovereignty, and warn of the dire economic consequences of lowering energy use. Using communications technologies and strategies available in the modern world, the general public has been peppered with corporate spins on environmentalists, politicians, and experts as doomsayers. A growing number of companies, by contrast, proffer a corporation-as-good-citizen image in hopes of assuaging public fears. Some are genuinely interested in making money without harming the environment.

Beneath the maelstrom of more and less agitated profit interests, there has been the steady and persistent alignment of the corporate lobby around an agenda of marketisation as the proper policy response (if there is to be any) to climate change. It is this pledge of allegiance to the ‘logic’ of the market that can be expected ultimately to win the day in corporate circles.⁷

It has taken a while for business groups to settle for a market-based climate policy. But before the ink had dried on the UN Framework Convention in 1992 at the Rio Summit, then President George Bush had announced U.S. backing of the corporate position that climate change was an economic, not an environmental, question. Bolstered by studies released by some of the elite of the U.S. economics fraternity (see: Schelling, 1991 and Nordhaus, 1991), actions to reduce greenhouse gas emissions were portrayed as potentially damaging to national economic growth and employment, international trade, and world development. In these studies, a novel view of ecology was presented: in essence, this research counselled that societies need to evaluate the tradeoff between confidently asserted economic promise and sceptically portrayed environmental gain that derives from uncertain science; as though economic reality has an incontrovertible claim of existence and environmental reality has, by comparison, only a tenuous one.⁸

But from a corporate perspective, this depiction of climate change as a matter of tradeoffs got it right. And with American governmental support, international negotiations quickly moved to accommodate the concerns of business. First, the negotiations followed the corporate call for a voluntary formula for reducing greenhouse gas releases. It was depressing

... and amusing: world political leaders, with the aid of an all too obliging media who would repeat the message everywhere, saying with straight faces that industry, if granted the freedom to voluntarily find solutions, would lead the world to a least-cost, efficient response. When that response proved by 1997 to mean an increase in greenhouse gas emissions by the world's corporate volunteers, it was concluded that something more had to be done. Indeed, the record of Annex I environmental volunteerism was so abysmal⁹ that an alternative policy had to be quickly found before the embarrassment of it all became more than even the wealthy elite could ignore.

Business was ready to offer a new road map. From a corporate perspective, the failure of the voluntary regime was attributable to the lack of suitable incentives to stimulate business involvement in saving the planet. At Kyoto and since, international strategy – guided by the business lobby – has focused on policies to make it profitable to cut carbon dioxide releases. To achieve this, an explicit climate market is being installed with atmospheric property rights designated in order to vest industry with an interest in changing the chemistry of the atmosphere (again).

An explicit climate market is being installed with atmospheric property rights.

Some commentators interpreted business' calls for marketing strategies to reduce greenhouse gas emissions as driven by an imperative of cost minimization. However, recent U.S. research has identified a wide range of measures to reduce emissions in all sectors of that country's economy at vanishingly small cost (e.g., Interlaboratory Working Group 1997 and UCS/Tellus Institute 1998). Resistance to reducing national emissions has little to do in the U.S. or other Annex I countries with cost. Instead, the problem is profit. Quite simply, there is more money to be made at a faster clip from investments in 'financial instruments' – another way of saying buying and selling paper commodities and skipping the heretofore required intermediary step of actually producing something in the process. Stock exchanges around the world and the recent Asian financial crisis – a case of what happens whenever more money can be made in another region than yours – furnish evidence of this fact of post-modern life.

Of course, money can still be made in energy investment.¹⁰ But what are now appearing as ‘financially sensible’ capital investments in Annex I energy sectors are: 1.) ‘life extension’ of its infrastructure – which means investment in continued industrial-scale pollution of the variety only possible with ‘cheap’ energy options like coal-fired power plants and oil refineries; 2.) investment in mega-projects such as pipelines, dams, liquefied natural gas facilities, and really big power plants when (and only when) state-provided risk immunities are available (obviously, offering little solace for those hoping for a different environmental future than the existing one); or 3.) investment in deregulated energy markets where speculative profit, rather than institutional transformation of the sort described in Amory Lovins’ old ‘soft energy path’ strategy (1977 and in later books), is the order of the day.¹¹ In none of these cases can we imagine anything like the 50 or more years of concerted effort to reduce carbon dioxide emissions that the IPCC thinks is needed.

5. State-of-the-art environmental policy for a postmodern world

The full emergence of market-oriented policy tools has yet to be realised. Institutional arrangements to implement a market approach are, however, well underway. An Annex I expert group met in March 1999 in Paris to swap experiences in setting up emissions trading and quota systems and, not unexpectedly, their meeting concluded with a call for the establishment of an International Emissions Trading Association (IETA). Participants agreed that an IETA – the brainchild of COP-4 in Buenos Aires – should be an independent, industry-led, non-profit international organization that could oversee an open and competitive emissions trading market. In light of the ecological track record of such organizations – think of the WTO and NAFTA – can there be any wonder that environmentalists greeted the news about the formation of such an association with deep scepticism?

What sort of trading might an IETA oversee? The Kyoto Protocol currently allows emission trading only among Annex I countries: these Annex I countries or their companies can only purchase emission permits from other Annex I countries. Advocates of emission trading argue that efficient levels of greenhouse gas reductions can be achieved from trading because societies have different marginal benefits and costs associated with greenhouse gas mitigation due to variations in income, economic growth rates, fossil fuel endowments, and energy systems.

The devil, of course, is in the details. What will be an ‘efficient’ trade? Well, the emission caps set in Kyoto for Russia and the Ukraine call for carbon dioxide emissions in 2008-2012 that are equivalent to each country’s 1990 level. However, as a consequence of economic implosion on the way to their respective capitalist transitions, neither country is expected to realise 1990 emission levels by 2008-2012, even under generous business-as-usual scenarios. This is because Russia’s emissions are currently 33% below their 1990 level, and Ukraine’s are 56% lower. Thus, a money maker that allows ‘efficient’ compliance with the Kyoto Protocol will be technology transfers to Russia and Ukraine that enable them to increase their emissions by, say, 32% and 55%, respectively while permitting another Annex I country (or two, or three, or four) to increase their emissions ... but slowly. And everyone makes money.

The U.S. is counting on trading with former Soviet bloc countries to meet as much as 56% of its Kyoto commitments (see Kopp and Anderson, 1998). Through such atmospheric trades, together with other ‘flexibility’ measures, there is the arresting prospect that the

U.S. may be able to meet its Kyoto obligation of a 7% reduction in carbon dioxide emissions from 1990 levels by *actually increasing* its carbon emissions by 12-16% (Pearce, 1997:10; and Flavin and Dunn, 1998). The purchase of so-called 'hot air' allowances, or allowances from other nations that are not accompanied by meaningful long-term domestic carbon reduction measures, has the merit of profit, if not environmental sustainability. Relying on purchased allowances also reduces the impetus for significant technological change in Annex I countries, thereby sheltering their populations from the inconveniences of 'inefficient' reductions of carbon dioxide. In effect, emissions trading allows carbon dioxide emissions growth for countries that can afford to pay for permits and relies on those who cannot to bear the de facto burden of cleaning up much of the mess. Not a bad deal, if you're wealthy. And if you're comparatively poor, at least you receive some compensation for your state.¹²

The Kyoto Protocol also authorizes joint implementation projects among Annex I countries (Article 6). Under this policy, countries may receive 'credits' toward meeting their targets through project-based emission reductions or sink expansions (i.e. reforestation) in other countries. The private sector will lead in the execution of this mechanism. Joint implementation allows, as an example, high carbon dioxide emitting countries to pay for the development of tree plantations and/or use of more energy-efficient technologies in another Annex I country as a means of offsetting carbon dioxide emissions in the paying country.

It is not obvious how joint implementation, as defined in the Kyoto Protocol, can serve the goal of sustainability since it will only offset one Annex I country's increased emissions with another's reduced emissions (for example, the U. S. counts the sink value of a forest it plants in Eastern Europe in order to offset its own emission growth). With Annex I nations responsible for nearly two-thirds of cumulative carbon dioxide emissions since 1950, and with the need to reduce world carbon dioxide emissions to 60% of 1990 levels or more to achieve climate stability, a program of emission offsets hardly seems responsive to the magnitude of the problem at hand.

Joint implementation can hardly be welcomed as a tool of sustainability, when, after all, it is a method of issuing licenses to wealthy countries which allows them to live beyond the planet's carrying capacity. Yet, its efficiency as an economic tool cannot be in doubt. Who better to hire to manage Eastern Europe's dwindling forests, for example, than those with the most advanced forest industries? Companies that decimated Northern

forests over the past century have recently learned how to maximize the value of a forest without unvarnished clear-cutting. This know-how, when applied can now efficiently (a.k.a. profitably) add to the stock of economic wealth and, thereby, assist the human species in consuming well beyond ecological limits. By observing the operations of corporate forestry (literally in the field), it is hoped by joint implementation's advocates that the less efficient in Annex I will realize their past mistakes, correct them, and become partners in the quest for efficiency (a.k.a. profitability).

Then, there is the boldest policy initiative in the Kyoto Protocol. The Clean Development Mechanism is promoted in the Protocol as a means for North-South cooperation in lowering greenhouse gas releases. It will allow industrialized countries to earn credit for carbon reduction activities in developing countries. The rationale of the Clean Development Mechanism is that developed countries will be able to reduce emissions at lower cost through projects in developing countries than they could at home, while developing countries will be able to receive the kind of technology that can allow them to grow more sustainably (see Article 12 of the Protocol). Importantly, certified emission reductions under the Clean Development Mechanism are scheduled to begin in the year 2000 and will count toward compliance with the first budget period of 2008-2012.

Meeting developing nations' needs for technology requires transfers responsive to their circumstances

One problem with this approach is the type of technology transfer that might ensue. Limiting the opportunities for transfer of appropriate technology to those that are profitable to Northern suppliers – which is what the Clean Development Mechanism facilitates – vests the incentive for technology transfer in the developed nations' economic strategies to 'reduce' emissions. Meeting developing nations' needs for technology would require transfers that are responsive to *their* circumstances, yet the Clean Development Mechanism may often accomplish the opposite, shaping such transfers to meet the circumstances of the Northern exporters, despite the best efforts of governments in recipient countries.

For those focused on the chemistry of the atmosphere, the Clean Development Mechanism raises the troubling possibility of phantom emission reductions: essentially, it is in the

interest of firms and project managers in developing countries to forecast really big increases in carbon dioxide emissions, unless the Clean Development Mechanism compensates them; then, the market efficiently substitutes present-tense emissions growth in Annex I countries for future-tense emission reductions in developing countries. That is, emissions that actually exist are counted as not existing; and those that don't exist ... well, they too are counted as not existing. Add these together and, in the brave new world of the Clean Development Mechanism, you learn that carbon dioxide emissions decline, even when they haven't. But if the arithmetic of environmental virtuality is mystifying, its economics should not be. Everyone is likely to make money in this deal – even the South.

As the above review should suggest, there are serious social and ecological flaws in current proposals for the development of emission markets to avert climate change. While emission trading is a useful tool when intelligently designed and while there are approaches to emission trading that would clearly be better for the environment and society than those currently proposed, there is a fundamental objection to primary reliance on an emissions trading regime: it cannot deliver the scale of change and timeliness of action required for climate stability and it could deepen global inequality (even as a few Southern countries may realize modest some short-term profits).

6. An alternative – equity and sustainability in the greenhouse¹³

In reply to the above critique, it may be asked, “Is there any real chance of a different fate for climate policy than the current one, especially given the immense political, economic and scientific edge held by the Annex I bloc?” Putting the interests of the environment and social welfare first will require adoption of an alternative regime with an expectation of very different outcomes. What might be guiding principles for an alternative regime?

Lost in the whirl of post-Rio machinations are the values of sustainability and equity that initially animated many of the participants to become involved in the UN Framework Convention process (this is especially true of the civil organizations who gathered at the 1992 Earth Summit to challenge governments to fashion an environmental, not an economic, treaty). Equity and sustainability principles offer the starting points for a new international regime that might meet the standard of ‘ecological justice’ (Low and Gleeson, 1998). While no set of principles can resolve the philosophical complexities of achieving an operational definition of ecological justice, sustainability and equity offer a starting point; environmental and social impact, rather than revenue, should determine policy success. Living within the biospheric carbon-carrying capacity of the planet under conditions of non-human induced climate change provides a first-order measure of sustainability. Achieving this standard in a manner that respects equally all peoples of current and future generations, non-human interests, and ecosystems, is likewise a first-order measure of equity. When examined against these broadly defined elements of ecological justice, there is little doubt that the current approach to the problem of climate change will fail to realize a climate-stable future or meet the interests of all peoples and nations fairly.

We should set a sustainable and equitable emissions rate through the per capita allocation of the known global carbon sink.

Lacking the certitude of economic rationality (at least from the perspectives of commercial and state interests), equity and sustainability are often dismissed as ‘philosophical’ and ‘impractical’ criteria for the design of policy responses to meet the goals of the UN Framework Convention. Such cavalier treatment of these principles is as false as it is self-serving. There have been numerous proposals for a sustainability and equity-based policy response

to climate change that have garnered international support. Admittedly, though, few have included a comprehensive, operationalised strategy. We suggest that a remedy on this score is to operationalise a sustainable and equitable emissions rate through the per capita allocation of the known global carbon sink.¹⁴ Byrne et al (1998) demonstrate how this can be calculated. By setting a global greenhouse emissions reduction target for the year 2050 at the level suggested by the IPCC for climate stability (i.e. bringing human-induced emissions down to a level equal to the global sink) and taking the resulting volume of allowable emissions and dividing them by the 1990 world population, a per capita allowance of greenhouse gas emissions of approximately 3.3 tons of carbon dioxide equivalent per year would constitute a sustainable and equitable emission rate.¹⁵

This rate can be used to establish the environmental ‘debt’ or ‘credit’ position of each country with respect to climate change by simply multiplying it by a nation’s 1990 population and comparing the resulting volume with actual national emissions in any given year. While it does not fully reflect the cumulative effects of emissions from different societies (the measurement of which is producing no end of debate), it furnishes a useable portrait of national responsibility for the climate change problem (see Figure 5). At present, there is an enormous difference in national per capita releases of greenhouse gases, with Annex I nations responsible for the highest release rates per person and, at the same time, the bulk of total emissions since the onset of the industrial era. Further, they still account for the majority of global emissions and are expected to continue to do so for decades to come. A climate-sensitive response from this bloc would mean lowering domestic emissions from, for example, the nearly 20 tons of carbon dioxide equivalent per person in the U.S. (and approximately the same amount by Australia) to the 3.3 tons standard by 2050.¹⁶

Domestic emissions would need to be lowered from approximately 20 tons of carbon dioxide equivalent per person in the U.S. and in Australia to 3.3 tons by 2050.

To borrow the 50 years anticipated in the Byrne et al strategy to retire the debt, Annex I members would make payments to an international fund for use by Southern countries in their efforts to build sustainable development paths of their own, while the North

rehabilitates its current unsustainable industries and practices. Payment rates would be set at the cost of avoiding a ton of carbon dioxide emissions through, for example, the adoption of higher efficiency technologies and lowering resource consumption overall. This should provide the business community with ample incentives – which they have felt were lacking until now in climate policy – to get cracking on the problem.

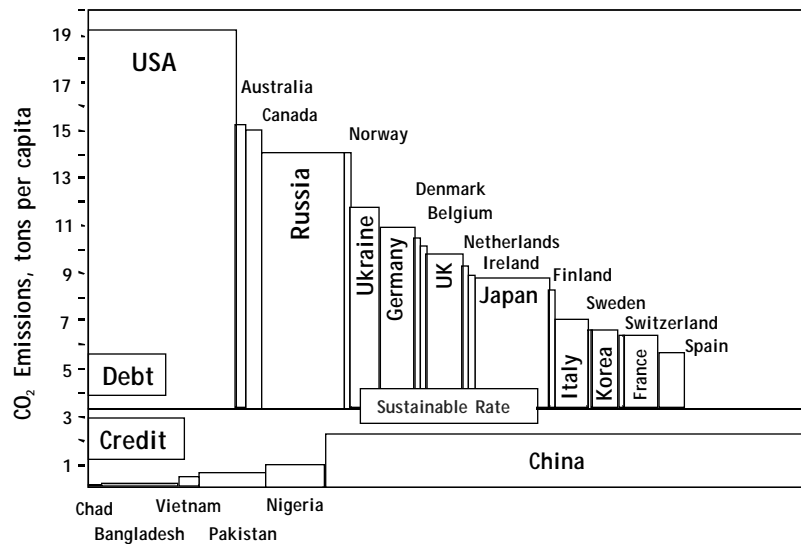
One area of needed effort is the rapid development of renewable energy. To date, energy conservation and energy efficiency have been primarily responsible for slowing the rate of growth in releases. But as the IPCC has noted in its Second Assessment Report (1996), even under the most optimistic assumptions regarding energy efficiency/ conservation potential, only one-half of the needed reductions can be expected from these sources. Thus, a sizable global commitment to renewable energy appears inescapable if climate stability is our aim. Nonetheless, investments in local and small-scale renewable energy systems remain negligently low. Unlike conventional energy systems, renewable energy is still regarded in business circles as a “frontier technology” requiring decades to mature. A reversal of this mindset by the business community would represent a welcome exercise of social and environmental responsibility.

Population growth is incorporated into this per capita approach

If a sustainable and equitable approach of the type outlined here were adopted, it would constitute a global commitment to what is commonly termed a ‘contraction and convergence’ strategy. Essentially, such an approach envisages a global system in which developed nations lower their emissions to a specific level, whilst developing nations are allowed to increase their emissions to that same level, over a specified period. Population growth is incorporated into this per capita approach, otherwise it can be argued that growing nations would enjoy an advantage over those with stable populations. Setting the population level under the scheme to an agreed reference year (such as 1990) means that each country has a fixed emission target based on its population in the base year. After the base year, any national population increases will work to the disadvantage of a nation, as this would decrease its effective per capita allowance. With such a reference year system, the per capita approach ensures equity.¹⁷

Such an exercise of environmental and social imagination is valuable for several reasons. Firstly, it promises to actually reduce carbon dioxide emissions, not an inconsiderable achievement given the track record of the negotiations to date. Moreover, the outlined strategy offers a realistic hope that the risk of human-induced climate change might be removed by the middle of the 21st century, again no small triumph when compared to current policy directions. Thirdly, it opens up a set of questions about global democracy that the existing international climate change regime has effectively closed off in its preference for an appearance of democratic process. Finally, such a strategy promises to take seriously the need for an ecologically just path to sustainability. Evaluated against the existing strategy being negotiated through the COP process, the principal deficiency of the ‘contraction and convergence’ approach is that it won’t make money for those who fail to cut carbon dioxide emissions. Instead, it would likely cost the Annex I countries approximately US\$8.0-9.0 billion per year for the 50-year period it would take to wean them of their carbon ‘habit’ (Byrne et al, 1998). This is not, however, a very high price to pay for such an important outcome.

Figure 5: CO₂ Emissions per Capita for Selected Countries



Note: Width of a block represents a country's proportion of world population in 1990.

Source: Data from World Resources Institute et al. 1998. World Resources 1998-99 (and earlier volumes. NY: Oxford University Press.

7. Conclusion

There is much of the familiar in the interplay of the discourses of science, market economics, and politics in the international response to the crisis of climate change. These are the standard tools that Western nations have brought to bear on a wide range of problems in the contemporary era. Yet, in this transposition of familiar approaches onto the novel problem of global environmental transformation, much is being overlooked. By assuming that greenhouse gas emissions are like any other commodity, industrialized nations are ignoring the real cause of climate change – the paradigm of endless economic growth, with its promise of uninterrupted increases in material consumption, that is the hallmark of Western progress.

The Annex I bloc may manage to capture the atmospheric commons as though it was a line of products available for sale. Indeed, UN-organized negotiations may effect an enclosure of a global commons under the management of Annex I shopkeepers. In this event, literally the air and weather – undeniably elements of the *lifeworld* of all species – may be commandeered by a handful of companies in a handful of countries. Their aim will be essentially to exploit the highest-profit options, and cutting global emissions will be a secondary concern. Of course, any success in making money from the atmosphere would be likely to be in the old-fashioned, imperial way: they will claim as theirs something they don't own and sell it back to the rest of us at a sizeable mark-up. The majority of the world's human population and all of its non-human species are regrettably money-poor and, thus, their only participation is likely to be looking through the shop window. As with much else, *caveat emptor* would seem to be the necessary advice for present and future generations who are not suitably incorporated for the coming competitive market in climate – beware what you buy from or sell to the global powers as they seek to shop their way out of the climate change crisis.

Industrialized nations are ignoring the real cause of climate change – the paradigm of endless economic growth and material consumption.

Commodification of the atmosphere will merely reproduce the same self-contradictory nature-society regime that has characterized the modern era. There are dangers that it will strip away communal rights of access and create new inequalities where none previously existed. An oxymoron of “scarce atmosphere” will result with no abatement of the crisis. To actually

avert global warming, an international regime founded on entirely different principles will be needed. The one advocated here – a global obligation to limit greenhouse gas emissions on the democratic principle of equal access to the atmospheric commons – rests on principles of social justice and ecological sustainability. It would lead to industrialized nations substantially cutting their greenhouse gas emissions and bearing the costs themselves to achieve such cuts (rather than transferring the burden to poor countries). Southern nations would have greater flexibility than industrialized countries in their economic choices related to greenhouse gas emissions, but eventually would also have to observe the same limit.

In drawing attention to the threats of commodification of the atmosphere, our aim is to underscore the importance of sustainability and social equity as necessary principles for an ecologically just response to the climate change problem. Market regimes that neglect these principles will create a climate shop in lieu of a social commitment to halt human-induced climate change. There simply is no substitute for the adoption of the tough measures needed to solve the problem and to do it in an equitable way. Economic measures such as tradeable permits have a potentially useful role to play, but if they are to make a valuable contribution, they must be situated within a regime of sustainability and social equity. Then, and only then, are they likely to be a part of the solution, rather than a continuing source of the problem.

Further reading

Agarwal, A. and S. Narain. 1993. *Global Warming in an Unequal World: A Case of Environmental Colonialism*. New Delhi, India: Centre for Science and Environment.

Byrne, John. 1997. *Equity and Sustainability in the Greenhouse: Reclaiming Our Atmospheric Commons*. Pune, India: Parisar.

Byrne, J., Wang, Y-D., Lee, H. and J-D. Kim. 1998. "An equity and sustainability-based policy response to global climate change." *Energy Policy* Vol 26(4):335-343.

Dryzek, John S. 1997. *The Politics of the Earth: Environmental Discourses*. New York, NY: Oxford University Press.

Flavin, Christopher and Seth Dunn. 1998. "Climate of Opportunity: Renewable Energy After Kyoto." *Issue Brief of the Renewable Energy Policy Project*. No. 1 (July). Washington, DC: Renewable Energy Policy Project.

Hamilton, Clive. 1999. *Greenhouse gas emissions per capita of Annex B Parties to the Kyoto Protocol*. Submission to Senate References Committee on Environment Inquiry into Australia's Response to Global Warming. Canberra, Australia: The Australia Institute.

Hawken, Paul, Amory B. Lovins and L. Hunter Lovins. 1999. *Natural Capitalism: Creating the Next Industrial Revolution*. New York, NY: Little Brown.

Hempel, Lamont C. 1996. *Environmental Governance: The Global Challenge*. Washington, DC: Island Press.

IPCC (Intergovernmental Panel on Climate Change). 1996. *The IPCC Second Assessment Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the UN Framework Convention on Climate Change*. New York, NY: United Nations Environment Program; Geneva, Switzerland: World Meteorological Organization.

IPCC, 1992. *Climate Change: The IPCC Scientific Assessment*. Edited by J.T. Houghton, G. J. Jenkins and J. J. Ephraums. New York, NY: Cambridge University Press.

Interlaboratory Working Group on Energy-Efficient and Low-Carbon Technologies (1997). *Potential Impacts of Energy Efficient and Low Carbon Technologies by 2010 and Beyond*. Washington, DC: U.S. Department of Energy.

Kopp, Raymond J. and J.W. Anderson. 1998. *Estimating the Costs of Kyoto: How Plausible Are the Clinton Administration's Figures?* Washington, DC: Resources for the Future.

- Lovins, Amory. 1977. *Soft Energy Paths: Toward Durable Peace*. New York, NY: Harper & Row.
- Low, Nicholas and Brendan Gleeson. 1998. *Justice, Society and Nature: An Exploration of Political Ecology*. New York: Routledge.
- Nordhaus, William D. 1991. "To Slow or Not to Slow: The Economics of the Greenhouse Effect." *The Economic Journal*. Vol.101, No.6. (July): 920-937.
- Pearce, Fred. 1997. "Dirty dealings: A coup at Kyoto allows the US to buy the right to pollute." *New Scientist* (December 20-27): 10.
- Redclift, Michael R. 1995. "Values and the global environment." In Guerrier, Y., N. Alexander, J. Chaste, and M. O'Brien (eds.). *Values and the Environment: A Social Science Perspective*. New York: John Wiley and Sons (pp. 7-17).
- Sachs, Wolfgang. 1993. "Global Ecology and the Shadow of Development." In W. Sachs, ed., *Global Ecology: A New Arena of Political Conflict*. Atlantic Highlands, NJ: Zed Books.
- Shelling, Thomas C. 1991. "Economic Response to Global Warming: Prospects for Cooperative Approaches." in Rudiger Dornbusch and James M. Poterba (eds.), *Global Warming: Economic Policy Responses*. Cambridge, MA: MIT Press (pp. 197-221).
- Shiva, Vandana. 1991. *The Violence of the Green Revolution: Third World Agriculture, Ecology and Politics*. Atlantic Highlands, NJ: Zed Books.
- Solomon, B. D. and D. R. Ahuja. 1991. "International Reductions of Greenhouse-Gas Emissions." *Global Environmental Change*: 343-350.
- Union of Concerned Scientists (UCS) and Tellus Institute. 1998. *A Small Price to Pay: U.S. Action to Curb Global Warming is Feasible and Affordable*. Cambridge, MA: UCS Publications.
- Young, Oran. 1996. *Global Environmental Change and International Governance*. Hanover, New Hampshire: University Press of New England.
- WEFA, Inc. 1998. *Global Warming: The High Cost of the Kyoto Protocol, National and State Impacts*. Eddystone, PA: Wharton Econometric Forecasting Associates.
- World Commission on Environment and Development (WCED). 1987. *Our Common Future*. New York, NY: Oxford University Press.

Endnotes

- ¹ This term is used here to denote a system of political and economic power – a political economy – which institutionalises social access to and use of nature, propounds ideas of nature, society and their relationships, and broadly seeks to frame the value of nature to society.
- ² The three principal greenhouse gases (GHGs) are: carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Of these, CO₂ is the most significant. Chlorofluorocarbons (CFCs) are also greenhouse gases but are dealt with separately under the Montreal Protocol.
- ³ Following the ratification of the UN Framework Convention in March 1994, COP-1 was held in March/ April of the next year in Berlin, with COP-2 in July 1996 in Geneva. Although several issues were discussed in the two early COP meetings, the viability and effectiveness of the goal for Annex 1 nations to return to their 1990 greenhouse gas emission levels by 2000 took centre stage. COP-3 then established binding emission targets for Annex 1 signatories.
- ⁴ Article 3 of the UN Framework Convention states that the nation-state signatories shall be guided by, among other things, precautionary measures to "...anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects." Such a precautionary philosophy means that where there are serious threats, "... lack of full scientific certainty should not be used as a reason for postponing such measures ..." Linked to such a directive is the requirement of an international management regime run by participating nation states.
- ⁵ See Our Common Future, the 1987 report of the World Commission on Environment and Development often referred to as the Brundtland Commission, after its chairperson, the then Norwegian Minister of Environment Gro Brundtland.
- ⁶ In the literature of international relations, the term "epistemic community" is used increasingly to refer to the participation of science-based organizations in international policy negotiations (see Young, 1996).
- ⁷ Notwithstanding the predictable holdout by certain firms against any agreement of any kind that includes carbon dioxide reduction targets because of their very real worry of losing money, lots of money, which cannot be alleviated by market gimmicks.
- ⁸ It is, of course, precisely the economists' tendency to doubt facts of ecology but not economy that split the IPCC (as noted above).
- ⁹ Only Germany, among the Annex I majors, is likely to meet the 1990 stabilization target set in Rio. Its 'success' in the volunteer round will derive from reunification with East Germany, whose economy promptly collapsed causing massive unemployment ... and lower carbon dioxide emissions.
- ¹⁰ The displacement of an oil major like Chevron by Intel in the Dow Jones Average, though, is a signal of diminishing opportunities.
- ¹¹ Subsequent to the approach promoted by Lovins in his classic 1977 book and additional writing in the 1980s, he has become convinced that a "natural capitalism" option now exists (see his book published in 1999 by that name with co-authors Paul Hawken and L. Hunter Lovins). The profitability of investments in energy conservation, energy efficiency, alternative energy systems and renewable energy sources has by now been commercially demonstrated in numerous applications around the world. However, high returns are still routinely found in investments in the conventional energy system compared with these alternatives. Such reckoning is partially a function of excluding the externalities of environmental damage associated with conventional energy systems, such as their greenhouse gas emissions.
- ¹² Such environmental welfare is positively anticipated by North America and Europe, another irony of climate change politics since these regions have spent the last 20 years downsizing their domestic social welfare programs.
- ¹³ This alternative was originally prepared for a monograph series in India. Entitled "Equity and Sustainability in the Greenhouse: Reclaiming Our Atmospheric Commons" (1997 by John Byrne), the monograph is available from the publisher Parisar (I.C.S. Colony, Gameshkhind Road, Pune 411 007, India) or the Centre for Energy and Environmental Policy, University of Delaware (Newark, DE 19716, USA).
- ¹⁴ The IPCC has commented at length on the uncertainties involved in measuring precisely the global carbon sink. But its 60% reduction target for greenhouse gas releases is widely accepted as a reasonable benchmark for defining a climate-stable circumstance in which little additional anthropogenic forcing of climate change would be evident. Thus, the IPCC reduction target provides a practical basis for measuring the global carbon sink for a sustainability-minded climate policy.
- ¹⁵ The proposal by Byrne et al fixes the sustainable and equitable emission rate at 1990 world population levels. Thus, as population grows, the allowable rate per person would necessarily decline.

¹⁶ The calculations in Figure 5 do not include the effects of land clearing. Recent calculations by Clive Hamilton (1999) indicate that when land clearance is included, the Australian lifestyle has the dubious distinction of being the most carbon-intensive.

¹⁷ Critical to the effectiveness of any global system is ensuring also that nations do not lower their emissions simply by shifting key industries producing high emissions to other countries. Industry relocation from the developed to the developing world has been underway for many years. Until recently, such relocation was thought to be prompted by the search for cheap labor and lower environmental standards. But now an intention to shift greenhouse gas emissions may also become an influential factor. Clearly, the emerging international system must control national activity to reduce emissions in this manner, a problem known in climate change policy jargon as 'leakage.' Accounting mechanisms are needed so that migration of industry doesn't alter the requirement to cut emissions below the baseline.

About the authors

John Byrne

is director and professor of the Center for Energy and Environmental Policy, University of Delaware and a contributing author to the Intergovernmental Panel on Climate Change - Working Group III. He is also executive director of the Joint Institute for a Sustainable Energy and Environmental Future - a research and advocacy organization headquartered in Seoul, Korea and funded by the W. Alton Jones Foundation to support civil society efforts in Asia to build a democratic and ecologically balanced future for the region.

Leigh Glover

is a research associate at the Center for Energy and Environmental Policy, University of Delaware and formerly served with the Australian Commonwealth Department of the Environment.

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