Sharing Wealth Globally and Sustainably: Tradeable Permits for Carbon Dioxide Emissions, Community Development, and Democracy

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Paper presented at the *International Congress of Engineers and Scientists*, "Challenges of Sustainability", Amsterdam, 22-25 August 1996.

Abstract

Reducing throughput, enhancing distributional justice, and increasing resource use efficiency, are widely regarded as essential conditions for achieving sustainable development, on the national as well as global level. Ingenious schemes such as the creation of an international market in tradable permits for carbon dioxide emissions, have the potential to move closer towards all three goals. For instance, Agarwal and Narain (1991), have proposed to allocate tradable emission quotas to nations on a per capita basis, which effectively implies a very significant transfer of wealth from developed to developing nations, but which also has the potential of increasing resource use efficiency, and of reducing the throughput in the materials economy, both on the global level.

But the introduction of such schemes poses formidable political-institutional obstacles and challenges. As all schemes involving the allocation of property rights, many questions arise regarding their institutional design and implementation. Even more fundamental issues are associated with the constraints inherent to the existing political order, on the international level as well as on the level of nation-states. It raises or revives even the spectre of world government, a notion which still seems a far-off reality. In all, it may seem that such proposals are doomed to qualify as unrealistic dreams.

The paper sets out to identify and discuss some of the political-institutional obstacles and issues associated with the introduction of a global property rights scheme for carbon dioxide emissions, and to reflect on various ways of addressing these, including international regime governance options that precede, or circumvent, the need for establishing full-scale world government. Finally, these options will be assessed on their political-strategic potential to identify which course of action seems politically most feasible.

Reference:
Agarwal, A. and Narain, S. (1991), Global Warming: A Case of Environmental Colonialism. New Delhi: Centre for Science and Environment.

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SHARING WEALTH GLOBALLY AND SUSTAINABLY: SOME REFLECTIONS ON POLITICAL-INSTITUTIONAL ISSUES ASSOCIATED WITH CREATING AN INTERNATIONAL MARKET FOR TRADEABLE PERMITS FOR CARBON DIOXIDE EMISSIONS.

Introduction

During the 1990s, interest in the idea of establishing some kind of international system of tradeable permits for carbon dioxide emissions as a means for combating the greenhouse phenomenon has grown considerably. Although promoted primarily for economic (efficiency) reasons, the idea has also attracted support because of its potential to be linked to equity issues, in particular by allocating emissions rights on a per capita basis, which may involve a considerable transfer of wealth from developed to developing countries (Agarwal and Narain, 1991; Barrett, 1992; Bertram et al, 1990; Grubb, 1989; Tietenberg, 1992). A further (environmental) advantage of such schemes is that the total level of emissions is determined beforehand (on a level lower than the existing level), thus providing certainty with regard to environmental outcomes (assuming effective implementation). Because of these potential economic, social, and environmental advantages, the notion of a system of tradeable emissions for CO2 emissions deserves serious contemplation.

Politics, however, provides the main obstacle to the introduction of such a scheme. Even though there are many technical issues that need to be resolved before tradeable CO2 emission permits can be introduced, it is the political aspects and implications of such proposals that are the "hard part". Key political issues are the allocation of emission rights, the design of the institutional framework within which trading occurs, and the reallocation of wealth and power associated with these (Barrett, 1992; Grubb and Sebenius, 1992). As a result of these difficulties, the idea of introducing a full-scale system of tradeable permits for CO2 emissions has receded into the background to make place for a watered-down version of emissions trading, namely "joint implementation (JI)" (Jepma, 1995; Kuik et al, 1994).

Joint implementation, however, is fraught with its own difficulties, and treated with apprehension by developing countries and environmentalists (Dubash, 1994; Gosh and Puri, 1994; Hare and Stevens, 1995; Heintz et al, 1994; Kuik and Gupta, 1995; Pearce, 1995; Yaker, 1995). It can be argued that its main value lies in providing a bridge towards a global system of tradeable permits. A phase of joint implementation projects thus forms a transition period during which the political issues associated with the establishment of a global CO2 emissions permit system can (and need to be) sorted out.

There are, of course, alternative strategies for combating the greenhouse phenomenon, such as the introduction of a global CO2 tax, the adoption of an international agreement which sets reduction targets, regional agreements, and a reliance on national strategies (Grubb, 1989). But each of these is also problematic and unlikely to be sufficient on its own to affect the reduction of CO2 emissions on a global level (of in between 50 and 80%) that is said to be required to stabilise CO2 concentrations at present levels (Flavin, 1990:20; Brown, 1995:66; Grubb and Rose, 1992:3). Given the combination of potential advantages associated with a global tradeable permit system for CO2 emissions referred to above, this idea remains one of the most promising strategies for combating the greenhouse phenomenon in a way that meets the goal formulated by Bertram *et al*. (1990:11): "The goal should be to identify a regime which is effective, simple, self-enforcing, politically acceptable, progressive if anything in its

impact on income distribution, and which requires the minimum of overarching international authority."

One way of addressing the political aspects of such proposals is to emphasise and elaborate their potential to enhance welfare and democracy. Assuming that politicians need to justify their position with regard to a global tradeable permit system to their peoples, it will be increasingly difficult for them to maintain their opposition to such proposals if it can be plausibly demonstrated that such schemes would benefit the big majority of people in their countries. If it can be shown that their introduction helps to empower people to meet their development aspirations in a sustainable manner, thereby also enhancing the political legitimacy and stability of political regimes, such proposals may become politically a lot more attractive. Decision makers need to be persuaded to look at such schemes as an opportunity instead of a threat.

The idea that a global system of tradeable rights for CO2 emissions provides an opportunity for enhancing sustainable welfare and democracy will be further elaborated upon in this paper. First, the question of the allocation of emission rights will be elaborated upon, in association with the specification of such rights in the light of the need for sustainable development. The core of the argument is that the allocation of rights to "individuals-in-community", instead of to polluters or governments, is more likely to lead to sustainable development, in developed as well as developing countries. Second, the potential of such a scheme to enhance democracy by associating its introduction with particular institutional arrangements, will be elaborated upon. Third, some thought will be given to the political viability of these ideas.

CO2 Emission Rights and Sustainable Development

The question how emission rights[1] should be allocated is primarily ethical and political in nature. From an economic point of view, it does not matter how such rights are allocated, as different forms of allocation are cost-effective--as long as all receivers are "price-takers", transaction costs are low, and entitlements are fully transferable (Tietenberg, 1992:129). Economically, there are no compelling reasons for allocating rights to the poor rather than to the rich, to emitters rather than to those affected by emissions, to developing rather than developed countries.

From an ethical or equity point of view, however, the question of allocation is highly significant, and is a key issue particularly advanced by representatives from developing countries in the context of past and present disparities in CO2 emissions, and therefore responsibility for global warming. As developed countries have so far been the main source of anthropocentric greenhouse gas emissions, and contribute even more on a per capita basis, it is considered that they have a moral responsibility to carry the heaviest burden in abatement efforts (Agarwal and Narain, 1991; Barrett, 1992; Grubb, Sebenius, Magalhaes and Subak, 1992; Pachauri, 1994).[2] It can even be argued that in the case of global warming equity issues are paramount (Rose, 1992:56). Therefore, the chance of a tradeable emissions scheme being

1 In this paper, the terms emission rights, permits, and entitlements will be used interchangeably.

2 Industrial countries are estimated to be responsible for approximately 75% of the fossil-fuel derived carbon dioxide in the atmosphere (Grubb, Sebenius, Magalhaes, and Subak, 1992:305), for 60% of total carbon dioxide emissions, and for more than two-thirds of the consumption of primary energy (Mintzer, 1992:6).

introduced may depend foremost on whether international agreement can be reached on equity considerations, and not on whether such a scheme is the most efficient or cost-effective means of reducing emissions.

But the views on what is equitable in this matter, vary largely. The concept of equity can be related to a range of principles, with widely diverging outcomes (Rose, 1992). The debate about this matter is further compounded by the confusion of individuals with states when it comes to distributional justice (Beckerman and Pasek, 1995). There is not one particular principle of set of principles that commands general agreement on how allocation should occur.

As there is no consensus on the ethical basis on which an allocation of rights can be justified, the appeal to ethical principles is intricately interwoven with political ideologies, interests, and power. Equity principles play an important role in the political promotion of alternatives and in justifying whatever political position is taken.

This does not imply that the question of the allocation emission rights should be left to the play of political forces, that "might is right". But is does imply that those who advocate a form of allocation that appears incongruous with prevailing ideologies, interests and powers have the difficult task to present their proposals in ways that are politically viable or attractive, and/or such that the distribution of political support and power is changed in favour of their proposals. The strength of argumentation plays an important role in this (Majone, 1985).

Within the context of the growing international support for the ideas and ideals associated with sustainable development and democracy, two lines or argumentation can be put forward that may help to overcome the political obstacles associated with the introduction of a tradeable CO2 emissions permit system in general, and the issue of the allocation of emission rights in particular. In the remainder of this section, the arguments in favour of allocating rights to "individuals-in-community", associated the need for promoting sustainable development, will be elaborated upon. In the following section, this idea will be given an institutional form that fits within the desirability of enhancing democracy.

In much of the literature about tradeable emission rights, it seems to be taken for granted that rights need to be allocated to either governments (states) or polluters. Yet, as argued by Bertram et al (1990:14), allocating such rights to governments or polluters is highly undesirable from "equity and incentive points of view". Why should polluters be rewarded for "having invested in environmentally damaging activities?" (Ibid:14). Allocating rights to polluters may create (or reinforce) monopoly power and contributes to increasing existing disparities in wealth and power. Allocating such rights to governments may lead to revenue-maximising behaviour by the issuing agency (Ibid:14). It would further strengthen the role and power of central governments without any guarantee that the income derived from such rights will benefit individuals and communities most in need of (sustainable) development.

Allocating emission rights to individuals, on the other hand, can be ethically justified on the basis of the simple moral principle "that every human being has an equal right to use the atmospheric resource" (Grubb, 1989:37). All people should have the right to the same amount of "environmental space", certainly when it comes to such a vital resource for human life as the atmosphere. It is no more than just that those who presently use a disproportionate amount of such a resource, at the detriment of others, have their right to the resource

reduced to a level equal to that of others, and that those who presently underuse their quota have the right to increases their use of the resource to the same level.

Although simple and just, the principle is not without problems. First, the question is whether people of all ages should be allocated the same right. Some fear that if this were to be the case, that this may put a premium on population growth, which would put further pressure on the earth's limited resources. This problem can be addressed by allocating rights only to people from a certain age, for instance, 21 (Grubb, 1989:37), or by pegging rights to the existing population levels (Martinez-Alier, 1993:107). The latter solution provides a stronger incentive to maintain existing population levels or even to reduce population numbers.

A further objection against allocating rights to individuals are that the transaction costs of trading emission rights would be unmanageable and rise to the point where the economic (efficiency) benefits would be outweighed by these costs. This is true indeed if trading would occur on the individual level. But the proposal advanced here implies that such rights are traded by local or regional governments who represent all individuals within their community (-ies). The idea behind this is that the potential benefits of trading for individuals are much greater if they are pooled to be traded for (energy related) assets, technologies, or services from which all would benefit, and which would otherwise be difficult to provide. The idea goes back to the Daly and Cobb's concept of "person-in-community" which recognises that the well-being of a community as a whole depends on each person's welfare, and vice versa (Daly and Cobb, 1989:159-175). By recognising the right of every individual to a proportion of the atmospheric resource, but by exercising that right collectively via their community, "individuals-in-community" are in a much stronger position to exercise and reap the benefits of their collective rights. In this way, the transaction costs of trading emission rights would not just be reduced, but transformed into gains for the democratic process, which will be elaborated upon later.

One other objection advanced against allocating rights to the atmosphere to all people in the world is that this is inconsistent with the prevailing practices regarding other resources. For instance, the limited global resource of bauxite is presently regarded as the property of the countries in which reserves are located (the "haphazard contingencies of nature"), and not as a global common property to which all human individuals on earth have an equal right (Beckerman and Pasek, 1995). In answer to this it can be argued that the "haphazard contingencies of nature" can also be seen as the "haphazard contingencies of politics", and that increasingly there is a case for arguing that the political boundaries and allocation of rights of the past are no longer relevant nor legitimate when this threatens the survival of all. Others have pointed out the problematic nature of the notion of sovereignty in this context (Camillieri and Falk, 1992), and already such problems have led to the evolution of new political institutions on an international, regional, as well as national and local level. It is very likely that many other resources that are considered vital to the sustainability of life on earth will come to fall under new property and/or management regimes which represent the interests and rights of all people (and of non-human life) to such resources.

Apart from the fact that the allocation of emission rights to "individuals-in-community" can be morally defended, it can also be demonstrated that it is also highly desirable on practical and environmental grounds. In the context of the need for sustainable development, incorporating a recognition of ecological and resource limits as well as of social needs, there are also strong reasons for allocating CO2 emission rights "individuals-in-community".

Past experiences with "development", in developing but also developed countries, have shown the fundamental problems associated with "top-down" planning by central governments, international agencies, as well as with unmitigated "private" investments. Many development projects in developing countries have proved to be social, ecological, and--from the point of view of the country where they took place--also economic disasters. "Development" in many developing countries has led to an increase in poverty, community disintegration and social dislocation, a huge burden of international debt, and a decline in the ability of people to look after themselves (Redclift, 1987; Durning, 1990). Eighty-nine countries are now worse off economically than 15 years ago, and the inequality between the rich and poor in the world has increased, with the richest 20 per cent now 61 times wealthier than the poorest 20 percent, compared to 30 times better off in 1960 (United Nations Human Development Report 1996, quoted in The Guardian Weekly, 21 July 1996:1). But in the already "developed" world, further development also distracts rather than adds to human and environmental well-being, with pressures mounting from urban sprawl, infrastructure development (continued expansion of roads, high-speed railways, and air-ports), serious pollution of air, land, and water, the continued decline of many species of fauna and flora, the disintegration of communities, and a relative, if not absolute, decline in the quality of life (Brown, 1990; Hirsch, 1977). In both worlds, people are subjected to the same "imperatives" of globalised financial power, dislocation, unemployment, and declining security associated with "free" market and "free" trade policies, the commercialisation of all aspects of life, ever faster technological innovation, and growing inequality. Everywhere, people and national governments seem to be losing, or have lost already, control over their situation and future.

In reaction to these developments, alternative approaches to development have emerged which put an emphasis on the role of communities in initiating and guiding development. Community based development, some of it inspired by the ideas of Mahatma Gandhi, Paolo Freire, and E. F. Schumacher, aspires to empower people to be able to meet their own needs, with the development of appropriate technology, and in ways that are ecologically and socially sustainable. Although private property may continue exist and play a role in development, it is the community that determines its direction, type, and scale. In essence, community development implies the subjugation of economic decision making to community control (Wuyts, Marc et al, 1992).

Recognition of the desirability of community-based development is no longer confined to theorists or radical activists. It has become not only the preferred "NGO development strategy", but even something of a new orthodoxy, advocated now by international agencies such as the World Bank, and by officials and politicians in developed and developing countries alike (Dubash and Oppenheimer, 1992:267; Thomas, 1992). From a "Northern" perspective, Nitze et al (1992:342), for instance, after denouncing the failures of "mega-projects" in developing countries, argue:

To avoid such outcomes in the future, economic development institutions must change their approach for selecting and implementing development projects. Rather than simply processing project proposals put forward by central governments in recipient countries, these institutions should require recipient countries to implement a bottom-up, participatory decision-making process under which project proposals either originate from the local groups most directly affected or are presented to these groups for discussion and approval before being submitted for funding.

And a prominent negotiator for Pakistan in the International Negotiating Committee for a Framework Convention on Climate Change, presenting a "Southern" perspective, notes:

...we have to begin at the individual, at the community, and at the local level. Only then can we move on to reach the national level, let alone the global level (Hyder, 1992:336).

But the new emphasis on the desirability of a decentralised approach to development is not confined only to developing countries. It is also seen as relevant to the industrialised world (including formerly socialist countries), where the direction or involvement of central government in development has been blamed for many failures (such as the economically non-viable "Think Big" projects initiated by the New Zealand government in the early late 1970s and early 1980s). Although initiating development in these countries is now seen as primarily, if not solely, the responsibility of the "free market" or "private" sector, there has also been a move towards shifting the responsibility for assessing and approving development initiatives from central to lower levels of government. In New Zealand, for instance, key responsibility for environmental management and for exercising control over development has been allocated to Regional Councils, recently constituted on the basis of natural boundaries as well as a sense of community. On an even smaller scale, district councils have important powers regarding land use. Although the central government retains control over most policy areas that significantly affect the environment (such as economic policy, agricultural policy, energy, and transport policy), there is, at least in theory, greater scope for people to get involved in decisions regarding the assessment of environmental implications of development proposals (Bührs and Bartlett, 1993; Memon, 1993).

In the US, advances in energy efficiency and conservation have been achieved with the breaking up of power monopolies, and the involvement of communities in the development of energy ("demand-side") saving programmes. The key to success in such programmes is the linkage of individual and community benefits, as well as the introduction of "integrated resource planning", which requires power supply companies to assess the costs and benefits (including environmental) of power supply alternatives, which often implies that priority is given to energy saving programmes. These trends, combined with technical developments in alternative energy technologies, are likely to lead to the obliteration of large, central power stations and to the decentralisation of power generation in the service of smaller communities (Flavin and Lenssen, 1994:70-74).

As mentioned earlier, inherent to the notion of community development, and a necessary condition for its effectiveness, is the devolution of power to the community level. This does not only imply the transfer of formal powers from central governments to the local or regional levels of government, but also the allocation or generation of significant income and other resources (such as expertise) on these levels. Without these, community development is a hollow concept, a symbolic exercise, or confined to marginal matters at most.

The allocation of CO2 emission rights to "individuals-in-community" provides an opportunity for boosting genuine community development in developing and developed countries alike. The power and capabilities of existing or newly constituted communities (like the Regional Council in New Zealand) would be significantly boosted by the (direct or delegated) control over the collective emission rights of the community. Such a "person-in-community" construction, which can take a variety of institutional forms, allows for the benefits of the ownership of such rights to be shared by individuals as members of the community.

To ensure that the benefits associated with the ownership of emission rights accrue to all community members, and meet the requirements of sustainable development, two conditions should be imposed on the allocation of emission rights to "individuals-in-community". First, the ownership rights should be made inalienable, so that they cannot be sold, but only leased (for limited periods of, say, up to five years). This to avoid that rights accumulate in a few hands or new powerful monopolies which only serve their own interests (Grubb, 1989:34). The chance that entitlements would be sold--if allowed--is particularly large among poor people (the majority in developing countries), as they desperately need income to meet their daily needs. Allowing rights to be sold would only help to increase, not reduce, disparities in income, as the poor are hardly in a position to bargain and have the tendency to "sell cheap" (Martinez-Alier, 1993).

A second condition that should be attached to the introduction of CO2 emission rights is that they can only be traded in the (restricted) currency of projects or measures which contribute to carbon abatement and/or enhancing energy efficiency (Grubb, 1989:35); or, more broadly stated, directed at meeting the energy needs of the community on a sustainable basis. The rationale for this is obvious: if the establishment of a system of tradeable emission rights is to contribute to mitigating CO2 emissions, it should be avoided that such rights are used for the benefit of promoting development that may have nothing to do with limiting CO2 emissions, or that may even contribute to increasing emissions in unnecessary ways. In practice, this condition means that those who lease the rights will have to provide or finance energy related programmes or projects that meet the needs or aspirations of the community. Given the huge potential for increasing energy efficiency in the domestic as well as the public sector (house insulation; roof solar panels; investment in and funding of public transport; reducing energy consumption in public buildings, schools etc.), in developing and developed countries, and the competition between emitters for leasing rights, the scope for achieving major benefits in this area, and thereby enhancing people's individual and collective standard of living and quality of life at minimal costs, is significant.

It would also put a very strong incentive on CO2 emitters to identify and offer "least cost" energy programmes in the communities in which they are located, as the transaction costs of offering such programmes to communities further away may be significant. This puts communities in a somewhat advantaged position towards local industries. It may strengthen a community's stake in "their" local industries (which also provide employment) and enhance their bargaining position with regard to these industries when it comes to "rationalisation". Communities, in developed and developing countries, are therefore most likely to be the first in line to derive benefits from leasing their rights to local carbon emitters.

However, as the allocation of CO2 emission rights on a per capita basis implies that most of the rights would be allocated to people developing countries--given the larger population in those countries--and as the major sources of carbon emissions are presently located in developed countries, there will be a need for emitters to negotiate contracts for leasing emission rights with more distant communities. This need (and the level of competition) will be greater the smaller the total level of allowable emissions has been set compared with the present level (a 50% reduction would probably bring about pretty fierce competition among emitters for leasing agreements). Obviously, an underlying assumption of this scheme is that

emitters who are not able to cover their emissions from leases will pay a significantly higher price for each unit of emissions than the highest price paid for the same unit under a lease.[3]

Such an arrangement is likely to guarantee that the emission rights of even the smallest and remotest communities will be used, even if emitters do not themselves have the means to identify and negotiate directly with such communities. What is likely to happen is that specialised mediating agencies, and a variety of energy (services) suppliers specialised in meeting the needs of a range of communities most efficiently and appropriately (from small to big communities; with a diversity of energy needs), will emerge and compete with each other to offer their services to the CO2 leasing market. The emergence of such specialised agencies would ensure even more that the most efficient and cost-effective forms of providing energy services (with minimum distribution costs) would be offered to communities. This is also likely to give a competitive boost to alternative and decentralised forms of energy generation (which avoid high distribution costs). Another major advantage of such a scheme is that it allows communities to introduce energy services and technologies that are commensurate with the community's interests and preferences ("appropriate" technology and scale; socially and environmentally desirable) (Flavin and Lenssen, 1991).

Finally, a scheme along these lines provides a very strong incentives to emitters to reduce their emissions, via technological and/or other means. From an economic point of view, it is rational for emitters to use every opportunity to reduce emissions the level where the costs of doing so (per unit of emissions) equals the costs of leasing emissions rights. The smaller the amount of emission rights issued, and the higher the price of leasing these rights, the stronger this (ongoing) incentive will be.

Like any scheme in tradeable entitlements, also this scheme requires the administration of rights and contracts, and the monitoring of implementation. In some respects, national governments can play a role in these matters (by ensuring that all emissions generated from their territory are covered by leases, in monitoring, and in collecting charges for emissions not covered by leases). However, to facilitate the initial allocation of rights, to administer transactions, and to oversee the performance of emitters and governments, it is likely that an international organisation will have to be given coordination responsibility. But the degree of centralisation of power associated with this scheme is, for various reasons, likely to be less than that required under other schemes based on internationally agreed targets for the reduction of emissions, and/or the collection of charges to be distributed over recipients. First, the community-based nature of the proposed scheme implies a strong mutual interest of local communities and local emitters in each other, which will facilitate implementation, monitoring and policing. Second, as communities themselves specify the kind of projects for which they are prepared to trade emission rights, there is no need for establishing a potentially huge central bureaucracy that decides on the allocation of funds and on the kinds

[3] For the sake of argument, CO2 emissions in this paper are treated as stemming from clearly identifiable, major "emitters". This is, of course, not always the case, as in the situation emissions from traffic or farming, where many thousands if not millions of people contribute to such emissions. Obviously, a tradeable permit scheme for CO2 emissions scheme cannot deal with such diffuse sources of emissions, unless some means can be found to cluster such permits into major groupings (such as car manufacturers and the transport industry). To deal with emissions from diffuse sources, the introduction of other mechanisms, for instance a carbon tax or standards, may be more practicable and economic, however.

of projects recipients are allowed to spend this income on. Having responsibility primarily for overseeing and "vetting", and not having command over potentially very big funds associated with raising an international carbon tax, such an international agency is also likely to be more acceptable to national governments (Grubb, 1989: vii; Grubb and Rose, 1992:18).

For these reasons, it may also be politically more realistic to assign the responsibility for the collection of charges associated with emissions that are not covered by leases to national governments. However, such an arrangement has the drawback of providing counter-effective incentives to governments (for political-economic reasons they may either not want to police emissions very strictly or want to maintain the level of income associated with these charges). Furthermore, it would go very much against the spirit of the proposed scheme if the revenue generated by excess emissions would accrue to the governments of those countries that over-utilise their emissions rights, and not those who presently under-utilise their quota. Therefore, it seems desirable to negotiate an international arrangement whereby the charges for emissions not covered by leases are collected by an international agency, and that the revenue from this source is allocated in some pre-determined ratio and ways (for instance, to all countries on a per capita basis, and tied to the promotion of research on, and/or the introduction of, renewable energy technologies). Part of the revenue can, of course, also be used to finance the costs of administering the scheme.

In conclusion, a scheme involving the allocation of emission rights to "individuals-in-community", using a currency restricted to efficient and/or sustainable energy services, offers the potential to meet the development needs of communities, to reduce CO2 emissions to a sustainable level, to reduce income inequality across countries and communities, and to provide quality energy services to communities and individuals. Apart from these potential advantages, such a scheme may also contribute to enhancing democracy in both developed and developing countries. This we will discuss in the following section.

CO2 Emission Rights and The Enhancement of Democracy

The allocation of CO2 emission rights to individuals, on the conditions sketched above, not only has the potential to promote sustainable development, but also to enhance the involvement of people in decision making. On the condition that certain institutional arrangements are put in place, such a scheme is likely to enhance democracy of the direct (deliberative; participatory) as well as the indirect (decision making through representatives) kind, in all the countries involved.

It is sometimes argued that a reliance on economic instruments in public policy is detrimental to democracy of the deliberative or participatory kind. Such instruments, in particular those of a "property rights" nature, are said to diminish opportunities for public input and deliberation and help to "establish more firmly an economically rationalistic world, one populated by homo economicus rather than homo civicus". "Homo civicus is not good for democracy" (Dryzek, 1995:305-306). By contrast, although a reliance on regulation is sometimes referred to as a "command-and-control" approach, it is more likely to provide opportunities for public debate (Ibid:306-307).

This argument overlooks two important things. First, that market instruments themselves require regulation, for their establishment as well as their continued functioning. This is true for markets of all kinds, but even more so for "quasi-markets" created in the realm of public goods, such as air quality. Such markets are mostly created for the specific purpose to

achieve certain public objectives, such as a reduction of pollution levels. The allocation of property rights with regard to public goods is likely to arose considerable public deliberation (as in the case of CO2 emission rights allocation) and are also often accompanied by debate about goals (objectives; targets), as well as institutional arrangements, implementation and enforcement. Thus, the establishment of a "quasi-market" for CO2 emission rights is likely to promote deliberation on these matters on an ongoing basis, perhaps even more so than if such matters would be dealt with via other, more traditional, means (such as the formulation of regulations regarding technical ways of reducing emissions).

A second, and perhaps more fundamental, reason why a reliance on market instruments, and in particular the allocation of property rights, has the potential of enhancing and not diminishing democracy is that they may help to strengthen the economic basis for democracy, depending on the particular arrangements associated with such schemes. Allocating property rights to the poor instead of the rich would be a very explicit case of redistributing wealth and strengthening the relative social position of the first. But given the inverse relationship between population and income in the world, a per capita allocation to all individuals (poor and rich alike) also has the potential of reinforcing the economic basis for democratic decision making.

It is true that the majority of proposals or studies regarding the introduction of property rights regimes for public goods, including the level of CO2 in the atmosphere, focus on governments or emitters (polluters) as the primary candidates for receiving these rights. This may reflect the political reality in which those with the strongest economic interest in these matters are also more able to influence the debate, to identify options, and to define what is "realistic". However, there is no logical or a priori reason why emission rights should be allocated to governments or corporations, on the contrary. As atmospheric quality is vital to all human beings (as well as non-human life) and is therefore a public good, there is a strong case for allocating such rights to all people. The issue is not that property rights instruments are inherently undemocratic or inequitable (they are not), but to whom they should be allocated and how they should be regulated.

For CO2 emission rights to contribute to the enhancement of democracy, however, more is required than their allocation to all individuals. For their potential to enhance democracy to be exploited, they will have to be accompanied by certain institutional arrangements. Already, mention has been made of the need for such rights to be made inalienable, to restrict to avoid their accumulation in relatively few hands (thus worsening the economic basis for democracy). But for such rights to most effectively contribute to the well-being of most (if not all) in society, and strengthen public participation in decision making with regard to what "well-being" means, further institutional arrangements will need to be put in place.

The specific forms of such arrangements can vary and should themselves be subject to the process of "discursive design' (Dryzek, 1987). But what these arrangements should ensure is that all members of a community (as the collective holders of CO2 emission rights) have an opportunity to contribute to the debate about what kind of (energy related) programmes the community should select, accept, or put forward (demand) in exchange for leasing their emission rights. The range of options may be quite large, varying from domestic energy conservation technologies, alternative (renewable) energy supply technologies, and co-generation heating systems, to the development of energy efficient public transport systems. Over time, a community's priorities in these respects may well change. It is also possible that a community prefers a mix of options to accommodate the different needs of segments or

areas of the community. But what all of these options have in common is that they are of a true "person-in-community" nature, meeting individual as well as community needs or preferences.

A form of institutional arrangements for ensuring public input in these matters could be the establishment of a new, publicly elected, agency that has the specific task to identify or develop community needs in this area, to contact and liaise with potential purchasers (lessees) of emission rights, to oversee the implementation of the schemes adopted, and to generally ensure that the community's energy needs are met sustainably and most efficiently. Creating a separate agency for this purpose ("Community Energy Council") is likely to offer the best chance that these tasks are taken up with dedication and expertise, especially if its members are elected on a regular basis. Such and agency, having an interest in finding out as much as possible what the community's energy needs and preferences are, what the best options are for meeting those needs, is also likely to maintain an ongoing debate and exchange of information with the community on these matters.

Alternatively, the responsibility for managing the collective emission rights of a community could be granted to existing local or regional governments, who often already have responsibility for various community interests (such as housing, roads, public transport, environmental protection), and who are normally elected on a regular basis. This option may have the advantage of promoting the integration of the energy needs and preferences within the community with these other policy areas, prevent duplication or contraction in policy development, and avoid election or participation "fatigue". Although possibly implying a lower level of direct community involvement in the development of options, it may have the advantage of enhancing the level of interest in, and accountability of, local government overall. As people are likely to have a keen interest in how the community's revenue from leasing emission rights is spent, it may help to enhance the transparency of decision making on this level of government, as councillors may have different views on how to make the best use of the community's emission rights.[4]

Allocating CO2 emission rights to "individuals-in-community" may also help to enhance democracy in other ways. It is likely to strengthen the position of local government vis- -vis central government, in particular in the all-important area of energy policy and management. It also tilts the "playing field" of "the market" back in favour of "individuals-in-community" as communities gain control over a resource vital to themselves as well as to producers. As long as the demand for emission rights surpasses supply (and a globally sustainable level of emissions has not yet been achieved), communities will be in a strong position to negotiate energy related projects on their terms instead of those of energy producers. Perhaps most importantly, such a scheme may help individuals and communities to restore a sense of being "in control" of their own future and reduce manipulation by the anonymous forces of "the market" and technological development. Overall, the notion and experience of democracy is

[4] At present, the accountability of local government decision making in New Zealand is often clouded by the election of many "independent" representatives, who purport to take an "a-political" stance of what is in the community's interest. Not standing on a clear political platform, let alone a clear political programme, this effectively undermines their accountability, as voters do often have no idea as to who or what they are voting for, and as it is never clear to what extent they are (individually) responsible for what a council achieves (or fails to achieve). Not surprisingly, the turnout at local government elections is rather low, usually at around half of the electorate (Bush, 1980:46;201: Bush, 1992:115).

likely to take on greater meaning when "individuals-in-community" are able to link substantive outcomes to collective choices.

Even though the potential advantages of introducing a system of tradeable emission rights along the lines suggested are apparent, what are the political chances of such a proposal being adopted? Given the potentially rather radical implications of such as scheme, isn't it even more likely to be dismissed as "idealistic" and totally "unrealistic" than previous proposals for systems of tradeable CO2 emissions permits?

The Politics of Tradeable Emissions

As mentioned earlier, whether a system of tradeable emission rights for CO2 will be introduced, in what form, and on what conditions, is foremost a political question. Proposals hardly ever win the political day on their own merits: they have to be technically and financially feasible, to be advocated strongly, defended against competing proposals and dismissive reactions, receive adequate public support and the support of key political actors, and perhaps most of all: capable of meeting a need (problem) or range of needs on which governments have to act (politically). In other words, such a proposal will have to stand the tests inherent to the agenda-setting process (Kingdon, 1984).

It has been argued that the need for governments to act on the greenhouse phenomenon is influenced by the state of the economy: when the economy booms, governments may be more inclined to take (costly) measures to combat the greenhouse effect, but when the economy is in recession, it may be reluctant to do so, out of fear to slow down the economy even further (Paterson, 1993). As a general rule, this is a plausible argument. But apart from the fact that economic growth itself appears to negate more than fully the gains in reduction of CO2 emissions, and therefore a decline in emissions may never eventuate, this proposition seems too simplistic to assess the chances of a particular proposal being adopted.

More recently, perhaps partly in reaction to the complexities involved in setting up a tradeable CO2 emissions scheme, the idea of introducing a carbon or energy tax seems to have found increased favour among analysts, environmentalists, as well as governments (Malin Roodman, 1996). Various countries, including Sweden and the Netherlands, already have introduced such a tax (Fankhauser, 1995:108). But for such a tax to provide an effective incentive for reducing emissions, it has to be significantly high, in effect so high as to require comprehensive tax reform (reduction or elimination of other taxes), in order to avoid it from slowing down economic growth. Introducing a carbon tax also has regressive distributional (equity) implications, as it weighs more heavily on those with lower incomes, and on some industries. Although these issues can be resolved (Fankhauser, 1995:110-112; Grubb, 1989:28-29), and the tax itself is rather simple to implement, it is unlikely that it will reach the required level until a more comprehensive tax reform is achieved, which raises the complexities involved considerably.

Other difficulties with the introduction of a carbon tax relate to the fact that taxation is a blunt instrument for achieving goals (at what level does it "bite" into emissions, and by how much?), to the differences in levels and effects if introduced by countries individually (concerns about relative competitiveness), to the setting of appropriate level(s) if introduced concurrently (further complicated by currency fluctuations), and by the question who should

collect the tax, and how should the revenue be spent, if introduced on a truly international basis (Bertram et al, 1990:18-20; Grubb, 1989:27-32).[5]

Given all these difficulties, it appears that the introduction of an effective carbon tax on the international level is politically unlikely. This impression seems to be confirmed by the backtracking of the US president on an energy tax proposal, and of the European Union with regard to a carbon tax proposal.

Equally problematic is the alternative of formulating binding international agreements on specific targets for reducing emissions. Setting such targets (overall and/or per country) raises issues associated with the different starting points of countries (present and past emission levels; some countries already have reduced their emissions significantly), equity issues (what is fair to expect of each country, given its economic situation, climatic position, type of industries on which its economy relies, its natural resources, and its past record?), and implementation issues (powers of controlling agency, methods of monitoring and enforcement, measures if a country does not meet the set targets). Significantly compounding this approach is that if the levels set prove to be inadequate, the whole round of negotiations will have to be repeated, perhaps various times over. Given the complexities and time involved in such negotiations directed at achieving binding agreements, it has been argued that this option is the least workable, even though it seems to be favoured by most environmentalists (Grubb, 1989:20-22).

Despite these difficulties, agreement in principle on the introduction of binding targets for reducing CO2 emissions has been achieved recently, after the United States changed its position on this issue (The Guardian Weekly, 28 July 1996:7). However, actual targets have not yet been set, and all the above-mentioned problems still need to be resolved for the effectiveness of this decision to be proven. For the time being, agreed targets are likely to apply only to developed countries (Annex I countries under the UN Framework Convention on Climate Change), but in the longer term all countries agree to limit their emissions (Ministry for the Environment, 1996:29-30). To reduce the complexities involved, a tiered system of abatement targets for groups of countries may well prove to be the most acceptable approach (Barrett, 1992).[6]

Earlier, mention has been made of "joint implementation" (JI) as a weak version of emissions trading between countries, and closely associated with the notion of "offsets" (Roland, 1992).

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[5] Even at a modest level, such a tax may generate very large sums, and thus give enormous power to the agency administering the funds. Grubb (1989:27;32) estimates that even at a very modest rate, a carbon tax applied world-wide would raise more than US$2 billion per year, and more than US$100 billion per year if set at a level sufficient to make a serious impact.

[6] In principle, the adoption of targets is not incompatible with the introduction of a tradeable emissions scheme. In fact, the total level of allowable emissions (total of present emissions or base year emissions minus target reductions) can provide a benchmark for the total amount of permits to be issued. Allocation of permits can still be on a per capita basis to other actors than polluters or governments, and to "individuals-in-community" as proposed here. All emitters can be obliged to lease permits for their emissions from permit holders, and governments would then need to ensure that national reduction targets are met (for instance, by encouraging or facilitating "trade" in emission permits to the level required).

JI is attractive to industries in developed countries as a cost-effective way of meeting domestic emissions reduction requirements, by investing in CO2 reducing projects in other, particularly developing, countries (Leslie, 1996). However, it is treated with suspicion by many developing countries and environmentalists, as it seems to allow developed countries to circumvent responsibility for reducing their domestic emissions (Flavin, 1996:36; Reddy, 1994:138). Another difficulty lies in the selection of projects and in assessing the degree to which projects effect "true" reductions in emissions. A yet, JI is very much in an experimental stage, and does not represent a concerted international effort to reduce emissions in a significant way. It's unlikely to provide the full-scale solution to global CO2 emission control that some hope it can be. For it to become such a solution, it would have to grow into a global system of tradeable permits for which it is a shadow of a substitute (Dubash, 1994; Hare and Stevens, 1995; Heintz et al, 1994; Kuik and Gupta, 1995; Pearce, 1995; Yaker, 1995).

The significance of JI may be primarily that it provides a learning stage in the possible transition towards a more comprehensive international system of emissions trading (Grubb, 1992:11;18-19). On the basis of a gradualist approach, and dealt with in and open and transparent manner (Markandaya, 1994:41; Reddy, 1994:129), it offers scope for shaping JI projects more and more along the lines of a system of community guided development advanced in this paper. If this occurs, and the benefits of emissions trading on some of the terms specified (restricted currency, involvement of communities in identifying and specifying projects), it may well help to overcome the suspicion with which trading is now often regarded (Reddy, 1994:129;135), both by the governments involved as well as environmental groups. It may then also become apparent that the advantages of such trading can be more firmly secured if the legal foundations are laid to allocate inalienable ownership to "individuals-in-community" and to entrench democratic governance rules for their management.

Some may argue that the allocation of emission rights to "individuals-in-community" is incompatible with the strong (tradition of) centralisation of power in many countries, developed and developing alike, and that central governments are likely to oppose any move towards the strengthening of local government as they may see it as undermining their own power. No doubt, this is a real problem. But the more the benefits of such a scheme become apparent to communities (possibly via JI projects) and are communicated to many others by environmental groups and community networks, aid agencies and experts, and international organisations, the more difficult it will be for national governments to deny their own populations the benefits of such a scheme, and the more likely it is that they will be pressured from within their own population to change their position.

But such pressure should not even be necessary to convince governments that the benefits of a system that enhances the welfare of communities within their nation, diminishes the dependence on mostly foreign controlled supplies of energy resources that are steadily depleted, strengthens the energy infrastructure of nations and communities, mitigates the environmental problems associated with energy supply and use, and diminishes inequality and poverty, also reduces political alienation and strengthens the political legitimacy and stability of governments. Political leaders who fail to see that, also fail the people who they represent, and do not deserve the position that they hold.

Conclusion

The idea of establishing a system of tradeable emissions rights for CO2, despite the fact that it has been promoted for potential economic and ecological advantages (efficiency; reducing emissions to a pre-determined level), has encountered considerable difficulty in being accepted, by governments as well as environmentalists. Partly, this may be due to the complexities involved in such schemes, and the difficulty of grasping how it could function and provide benefits. It can also be attributed to the fact that, so far, much of the discussion about tradeable permits has occurred primarily among economists and few other experts, also within government. For such ideas to get accepted more widely, far greater effort is required in publicly explaining and discussing them.

However, some of the opposition to these ideas can be attributed also to an ideological distaste for "property rights" or "market based" approaches to environmental problems. This is regrettable, and even damaging to the environment cause, as it leads to a failure to see how such approaches can be adapted to become powerful mechanisms in the promotion of sustainable development (ecologically, socially, and economically), the strengthening of the economic basis of democracy, and the enhancement of deliberative, participatory, and representative democracy. It is true that, if monopolised by emitters (polluters) and/or governments, such schemes may do little to bring about such benefits, on the contrary, they may then contribute to widening the gap between rich and poor, the powerful and the powerless. But it is exactly the double-edged nature of such instruments that also makes gives them the potential to be used also in a politically progressive way.

The scheme proposed here is simple in broad outline. It recognises the "ecological imperative" of reducing anthropogenic emissions of CO2 by 50 or 60%. It notionally allocates what remains of the environmental (CO2) "space" to all humans in the world (including children) on a per capita basis, as a quantity of inalienable emission rights. It requires the development of fairly straightforward institutional arrangements for these rights to be exercised by "individuals-in-community", who determine collectively to whom their rights will be leased in exchange for energy related services ("restricted currency") that help to meet the community's energy needs in the most efficient, sustainable, and socially desirable way. The need to collectively decide on which projects to accept in exchange for leasing a community's collective emission rights also promotes deliberative or participatory democracy and enhances the transparency of local government decision making.

Those responsible for anthropogenic sources of CO2 emissions, on the other hand, will have to compete with each other to identify and offer energy programmes to communities (nearby and further away) in order to cover their CO2 emissions by emission permits leased from communities. CO2 emissions not covered by leases will be charged at a "penalty price" (higher per unit than the price per unit negotiated in leases), thus providing a powerful incentive to emitters to bring down their emissions, or to compete harder leasing agreements. To assist in these efforts, it is possible that companies specialised in offering energy services that meet the needs of a wide range of communities will emerge. How long it will take, in this scenario, to achieve a globally sustainable level of CO2 emissions, is of course uncertain. But by promoting efficiency and innovation, as well sustainable development and enhancing democracy, this path turns a major challenge into a great opportunity.

Politically, a scheme like this should be far more attractive than any of the other alternative mechanisms considered, including the introduction of a carbon tax and the adoption and implementation of emission targets on a country-by-country basis. Projects implemented under "joint implementation" can be seen as a (limited) precursor of the proposed scheme, and as a learning stage towards it. Expanding on JI projects to bring them more and more into line with the conditions required for community-controlled energy programmes is also a possible means for generating broader support for a full-scale tradeable emissions system based on property rights allocated to "individuals-in-community". Meanwhile, one would hope and expect that enlightened political leaders, and those who can be persuaded to be enlightened, will take the lead in embracing a course of action that offers so many promises.

References

Agarwal, Anil and Narain, Sunita (1991), Global Warming in an Unequal World. New Delhi: Centre for Science and Environment.

Barrett, Scott (1992), "`Acceptable' Allocations of Tradeable Carbon Emission Entitlements in a Global Emission Warming Treaty", in: UNCTAD, Combating Global Warming. Study on a Global System of Tradeable Carbon Emission Entitlements. New York: United Nations, pp. 85-113.

Beckerman, Wilfred and Joanna Pasek (1995), "The Equitable International Allocation of Tradable Carbon Emission Permits", Global Environmental Change, Vol.5, No.5, pp.405-413.

Bertram, I.G., R.J. Stephens, and C.C. Wallace (1990), Economic Instruments and the Greenhouse Effect. Wellington: Victoria University of Wellington, Working Paper Series 3/90.

Brown, Lester R., Nicholas Lenssen, and Hal Kane (1995), Vital Signs 1995-1996. London: Earthscan.

Brown, Lester R. (1990), "The Illusion of Progress", in: Lester R. Brown, ed., State of the World 1990. Sydney: Allen & Unwin, pp.2-16.

Bush, Graham (1980), Local Government and Politics in New Zealand. Auckland: George Allen & Unwin.

Bush, Graham (1992), "Local Government: Politics and Pragmatism", in: Hyam Gold, ed., New Zealand Politics in Perspective. Auckland: Longman Paul Ltd.

Bührs, Ton and Robert V. Bartlett (1993), Environmental Policy in New Zealand. The Politics of Clean & Green? Auckland: Oxford University Press.

Camillieri, J.A. and Jim Falk (1992), The End of Sovereignty? The Politics of a Shrinking and Fragmenting World. Aldershot: Hants.

Daly, Herman and John B. Cobb Jr (1989), For the Common Good. London: Green Print.

Dryzek John (1987), "Discursive Designs: Critical Theory and Political Institutions", American Journal of Political Science, Vol.31, No.3, pp.656-679.

Dubash, Navroz K. (1994), "Commoditizing Carbon: Social and Environmental Implications of Joint Implementation", in: Ghosh, Prodipto and Jyotsna Puri, eds., Joint Implementation of Climate Change Commitments. Opportunities and Apprehensions. New Delhi: Tata Energy Research Centre, pp.51-85.

Dubash, Navroz K. and Michael Oppenheimer (1992), "Modifying the Mandate of Existing Institutions: NGOs", in: Irving M. Mintzer, ed., Confronting Climate Change. Risks, Implications and Responses. Cambridge: Cambrdige University Press, pp.265-279.

Durning, Alan B. (1990), "Ending Poverty", in: Lester R. Brown, ed., State of the World 1990. Sydney: Allen & Unwin, pp.135-153.

Fankhauser, Samuel (1995), Valuing Climate Change. The Economics of the Greenhouse. London: Earthscan.

Flavin, Christopher (1990), "Slowing Global Warming", in: Lester R. Brown, ed. State of the World 1990. London: Allen & Unwin, pp.17-38.

Flavin, Christopher (1996), "Facing Up to the Risks of Climate Change", in: Lester R. Brown, ed., State of the World 1996. London: Earthscan Publications, pp.21-39.

Flavin, Christopher and Nicholas Lenssen (1991), "Designing a Sustainable Energy System", in: Lester R. Brown, ed., State of the World 1991. Sydney: Allen & Unwin, pp.21-38.

Flavin, Christopher and Nicholas Lenssen (1994), "Reshaping the Power Industry", in: Lester R. Brown, ed., State of the World 1994. London: Earthscan Publications, pp.61-80.

Ghosh, Prodipto and Jyotsna Puri, eds. (1994), Joint Implementation of Climate Change Commitment. Opportunities and Apprehensions. New Delhi: Tata Energy Research Institute.

Grubb, M. (1989), The Greenhouse Effect: Negotiating Targets. London: Royal Institute of International Affairs.

Grubb, Michael (1992), "Options for an International Agreement", in: UNEP, Combating Global Warming. Study on a Global System of Tradeable Carbon Emission Entitlements. New York: United Nations, pp.11-22.

Grubb, Michael and Adam Rose (1992), "Introduction: Nature of the Issue and Policy Options", in: UNEP, Combating Global Warming. Study on a Global System of Tradeable Carbon Emission Entitlements. New York: United Nations, pp.1-10.

Grubb, Michael and James K. Sebenius (1992), "Participation, Allocation, and Adaptability in International Tradeable Emission Permit Systems for Greenhouse Gas Control", in: OECD, Climate Change. Designing a Tradeable Permit System. Paris, OECD, pp.185-225.

Grubb, M, J. Sebenius, A. Magalhaes, and S. Subak (1992), "Sharing the Burden", in: I.M. Mintzer, ed. Confronting Climate Change, Risks, Implications and Responses. Cambridge: Cambridge University Press, pp.305-322.

Hare, Bill and Arjette Stevens (1995), "Joint Implementation. A Critical Approach", in: Catrinus J. Jepma, The Feasibility of Joint Implementation. Dordrecht: Kluwer Academic Publishers, pp.79-85.

Heintz, Roebijn, Onno Kuik, Paul Peters, Nico Schrijver, and Pier Vellinga (1994), "Summary and Conclusions on Joint Implementation", in: Onno Kuik, Paul Peters and Nico Schrijver, eds., Joint Implementation to Curb Climate Change. Legal and Economic Aspects. Dordrecht: Kluwer Academic Publishers, pp.161-179.

Hirsch, Fred (1977), Social Limits to Growth. London: Routledge & Kegan Paul.

Hyder, Tariq Osman (1992), "Climate Negotiations: The North/South Perspective", In: Irving M. Mintzer, ed., Confronting Climate Change. Risks, Implications, and Responses. Cambridge: Cambridge University Press, pp. 323-336.

Jepma, Catrinus J. (1995), The Feasibility of Joint Implementation. Dordrecht: Kluwer Academic Publishers.

Kingdon, John W. (1984), Agendas, Alternatives, and Public Policies. Boston, Toronto, Little, Brown and Company.

Kuik, Onno, Paul Peters and Nico Schrijver (1994), Joint Implementation to Curb Climate Change. Legal and Economic Aspects. Dordrecht: Kluwer Academic Publishers.

Kuik, Onno, and Joyeeta Gupta (1995), "Joint Implementation: Political and Practical Aspects with Special Reference to Africa", http://www.jt.org/jinews/africa.htm.

Leslie, Jim (1995), "Joint Implementation: Creating a New Market", http://www.ji.org/jinews/ji_jim.htm.

Malin Roodman, David (1996), "Harnessing the Market for the Environment", in: Lester R. Brown, ed., State of the World 1996. London: Earthscan Publications, pp.168-187.

Markandaya, A. (1994), "JI: The Way Forward or a Negotiator's Nightmare?", in: Prodipto Ghosh and Jyotsna Puri, eds, Joint Implementation of Climate Change Commitments. Opportunities and Apprehensions. New Delhi: Tata Energy Research Institute, pp.35-42.

Martinez-Alier, J. (1993), "Distributional Obstacles to International Environmental Policy: The Failures at Rio and Prospects after Rio", Environmental Values, Vol.2, No.1, pp.97-124.

Memon, Ali (1993), Keeping New Zealand Green. Recent Environmental Reforms. Dunedin: University of Otago Press.

Mintzer, Irving M., ed. (1992), Confronting Climate Change. Risks, Implications and Responses. Cambridge: Cambrdige University Press.

Nitze, William A., Alan S. Miller, and Peter H. Sand (1992), "Shaping Institutions to Build New Partnerships" Lessons from the Past and a Vision for the Future", In: Irving M. Mintzer, ed., Confronting Climate Change. Risks, Implications, and Responses. Cambridge: Cambridge University Press, pp.337-350.

Pachauri, Rachendra (1994), "The Economics of Climate Change: A Developing Country Perspective', in: OECD, The Economics of Climate Change. Proceedings of an OECD/IEA Conference. Paris: OECD, pp.171-182.

Paterson, Matthew (1993), "The Politics of Climate Change After UNCED", Environmental Politics, Vol.2, No.4, pp.174-190.

Pearce, David (1995), "Joint Implementation. A General Overview", in: Catrinus J. Jepma, The Feasibility of Joint Implementation. Dordrecht: Kluwer Academic Publishers, pp.15-31.

Reddy, Amulya K.N. (1994), "Commentary", in: OECD/IEA, The Economics of Climate Change. Paris: OECD, pp.128-140.

Roland, Kjell (1992), "From Offsets to Tradeable Entitlements", in: UNCTAD, Combating Global Warming. Study on a Global System of Tradeable Carbon Emission Entitlements. New York: United Nations, pp.23-33.

Rose, Adam (1992), "Equity Considerations of Tradeable Carbon Emission Entitlements", in: UNCTAD, Combating Global Warming. Study on a Global System of Tradeable Carbon Emission Entitlements. New York: United Nations, pp.55-83.

Thomas, Alan (1992), "Non-governmental Organizations and the Limits to Empowerment", in: Marc Wuyts, Maureen Mackintosh, and Tom Hewitt, eds., Development Policy and Public Action. London: Oxford University Press, 117-146.

Tietenberg, Tom (1992), "Implementation Issues: A General Theory", in: UNCTAD, Combating Global Warming. Study on a Global System of Tradeable Carbon Emission Entitlements. New York: United Nations, pp.127-149.

Yaker, Layashi (1995), "Joint Implementation from a Southern Perspective", in: Catrinus J. Jepma, The Feasibility of Joint Implementation. Dordrecht: Kluwer Academic Publishers, pp.87-97.

Wuyts, Marc. Maureen Mackintosh, and Tom Hewitt, eds. (1992), Development Policy and Public Action. London: Oxford University Press.