

Emissions Trading, Equity, and Sustainability: the Case for Allocating Entitlements to ‘Individuals-in-Community’

Introduction

Given the likelihood that a post-Kyoto climate change agreement will include provisions for trading greenhouse gas (GHG) emission rights (carbon credits), it is timely and important to look more closely into the merits (or otherwise) of emissions trading systems (ETS), in particular with regard to the issue of the allocation and distribution of entitlements. Thus far, ETSs and other tradable permit systems have allocated entitlements to those historically responsible for emissions or the exploitation of resources (the ‘grandfathering’ principle). There are, however, strong reasons for challenging this practice, and for advocating the allocation of entitlements to all people, in line with the *per capita* distribution principle.

This article argues that GHG emission rights, if they are to be granted, should be distributed on a globally determined equal *per capita* basis, but collectively managed by community bodies (Community Carbon Trusts – CCTs) on an ‘individuals-in-community’ basis, instead of being granted or sold by governments to (big) emitters. The approach advocated here is not only ethically more justified, but also strengthens the capacity of communities to deal with climate change and to advance sustainability. It offers an example of how a significant environmental challenge can be met in a more positive way than by the prevailing approaches based on narrow, mainly economic, considerations.

In this article I will, first, discuss briefly the idea of emissions trading and its popularity with regard to the control of global GHG emissions. Then, I will focus on the issue of the allocation and distribution of entitlements, advocating a more equitable approach than has been adopted by existing schemes thus far. Finally, the basic elements of an alternative scheme, in which emission entitlements are formally allocated to individuals but managed collectively by CCTs, are laid out, followed by a conclusion.

Emissions trading: An idea whose time has come?

The idea of trading emission permits finds its roots in economic theory (Baumol and Oates, 1988: 424; Bertram, 1992). In essence, it is based in the assumption that by allocating property rights to (portions of) a public good, the collective and individual interests in that good can be harmonised and effectively protected. Thus, the ‘Tragedy of the Commons’ scenario which often befalls common property resources (Hardin, 1968), in which the ‘rational’ pursuit by individuals of their interests leads to the destruction of a common good, can be avoided.

In the context of public ‘bads’ such as pollution, tradable permits can be allocated to the existing (or slightly lower) level of pollution, with the total amount allocated being gradually reduced over time to finally achieve a level that is considered sustainable or acceptable. All (major) emitters of the pollutant in question are required to obtain permits for the amount that they emit, with permits being either granted for free or having to be bought (via auction or on the market). The market price of permits will reflect their relative scarcity (the extent to which the existing level of emissions exceeds the total level of emissions for which permits have been issued). The higher the price of permits, the stronger the incentive on polluters to reduce their emissions. Ultimately, economic theory tells us, all emitters will try to reduce their emissions to a level where the marginal costs of doing so equal the benefits. In this way, the collective reduction of emissions is achieved most efficiently, as all polluters reduce their emissions at rates reflecting the differences in costs and benefits associated with reduction.

The idea of applying the notion of a tradable permit system to global CO₂ emissions emerged in the late 1980s. It was first raised in 1989 in a study commissioned by the Ministry for the Environment in New Zealand (Bertram, *et al.*, 1990) and subsequently caught the attention of the Intergovernmental Panel on Climate Change (IPCC) and other analysts (Grubb, 1989). Since then, its popularity has grown among governments and industries, especially with the increase in concern about global warming and the build-up of pressure for more effective action. As the costs of reducing carbon dioxide emissions varies across industries, sectors and nations, a tradable emissions scheme for such emissions seems more attractive than blanket regulation based on standard requirements across economies. Another option, a globally agreed carbon tax, offers less certainty in terms of achieving a desired level of emissions reduction, takes away money from people when they need it most, and cannot provide the steady signal that is required for meeting long-term policy objectives (Fleming, 2007: 33).

In recent years, interest in emissions trading has grown considerably. To meet their emissions reduction targets under the Kyoto agreement, a growing number of countries, including Denmark, the Netherlands and the United Kingdom, have adopted proposals for putting in place greenhouse gas emissions trading systems. By 2003, some 47 carbon trading schemes had been introduced, most of which in Europe (Hasselknippe, 2003). In 2005, interest in emissions trading was boosted significantly with the entry into force of the Kyoto Protocol, and when a trading scheme became operative at the EU level (Dunn and Flavin, 2002; Euraktiv, 2005). It has been noted that, based on current emissions projections, countries that have signed up to Kyoto will be relying heavily on these trading mechanism to meet their commitments (OECD/IEA, 2005: 64).

Although emissions trading scheme have become more popular, they are not without issues. Evaluations have pointed out a mixed bag of results regarding their environmental effectiveness and efficiency gains (Hahn, 1995; Tietenberg, 1992b; 2003). A wide range of issues and obstacles to their 'optimal' functioning in line with the expectations promised by economic theory have been identified, including gaps in information, transparency, monitoring and verification, insufficient or wrong incentives, low prices and/or uncertainty about the long-term price of carbon, and high transaction costs, and inadequate monitoring and enforcement (Tietenberg, 1992b; 2003). Many of these problems can be regarded as design issues that may well be reduced or resolved with time and experience. However, some are fundamentally political and relate to the preponderant role of governments, more or less influenced by vested interests, in the design and implementation of such schemes. There will always be a discrepancy between the optimal models designed in economic theory and 'really existing' models, among other, because political rationality leads governments to grant concessions to powerful interest groups. Moreover, in plain terms, parties often have strong incentives and plenty of opportunities for cheating (Davies, 2007; Davies and Adam, 2007; Lipow, 2007). All these problems, and past records, cast doubt on the claim that emissions trading schemes and other tradable permit schemes are indeed more efficient, effective and cost-effective in tackling environmental problems than more traditional forms of regulation (Lipow, 2007).

Doubts about emissions trading are not just fed by discrepancies between their theoretical economic advantages and performance in practice. They are also based on social and ethical concerns. The (relative) merits of tradable permits schemes should not be judged solely or even primarily on economic (efficiency) grounds. Political, social and ethical considerations have a significant role to play in their adoption or rejection, even if the economic advantages of such instruments can be demonstrated. Some have argued

that the use of economic instruments to address pollution, for instance, is *inherently* unethical, as they fail to stigmatise and punish behaviour that knowingly harms people and the environment (Kelman, 1981), and that this can be compared to the medieval practice of selling indulgences by the Catholic Church (Goodin, 1994). However, other policy instruments are not necessarily less problematic in this respect. For instance, setting standards raises issues regarding what are 'acceptable' levels of pollution, harm or risk, and usually implies allowing some pollution to occur without (financial or other) constraints. Banning *all* pollution avoids this problem, but could cause other adverse (social, economic) effects (such as unemployment), and is in many cases, like in the case of CO₂ emissions, not practicable within reason. Tradable permit schemes potentially can be as strict as standards in the (overall) level of pollution that they allow, and over time that level can be further reduced and ultimately set at zero, implying the phasing out of tradable permits.

The argument advanced here is that the merits and demerits of tradable permit schemes need to be assessed more broadly, to include social, and political as well as economic and ethical issues. Whether emissions trading, or for that matter any other tradable permit scheme is desirable, it can be argued, depends in large part on whether their ethical, social, and political advantages as well as their environmental effectiveness and economic benefits, compared to other approaches, can be convincingly demonstrated. To a large extent, these merits depend on the *design* of these instruments, including to *whom* entitlements are allocated and *how* they are distributed.

Allocation and distribution

Here, the term allocation will be used to refer to whom emission entitlements (or pollution permits) are granted (whether for free or for a price), while distribution refers to how much holders of such rights are allocated and to the spread or concentration of emission rights, also as the result of trading.¹ Although interrelated, these issues also raise different questions. Obviously, allocation affects distribution (as those who are not entitled to permits do not receive any), but permits can be distributed more or less equally among those who are entitled. Who is entitled is the primary question; how entitlements should be distributed depends on how that question is answered as well as other considerations.

Both questions are fundamentally ethical and political. In economic theory, it does not matter how entitlements are allocated, as different forms of allocation are cost-effective as long as permits are distributed in a way that all holders are 'price-takers', transaction

costs are low, and entitlements are fully transferable (Tietenberg, 1992a: 129; 2003: 401, 410-412). Economically, there are no compelling reasons for allocating rights to the poor rather than to the rich, or to emitters rather than to those affected by emissions. From an economic point of view, the distribution of entitlements is of concern only to the extent that their concentration would result in holders being able to use their (monopoly, oligopoly) position to influence price and trading. This does not mean that tradable permit schemes *cannot* be used to address equity issues. As Tietenberg notes: "...the initial allocation can be used to pursue fairness goals without lowering the value of the resource" (Tietenberg, 2003: 411), but this simply has been avoided. From an ethical and political point of view, however, allocation and distribution issues, also with regard to GHG emission entitlements, are highly significant.

Allocating emission entitlements to *all* people on an *equal per capita* basis has been 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). That all people should have an equal right to such a vital resource for human life as the atmosphere is a principle also underwritten by those who advocate an 'environmental space' (ES) approach. The ES approach is based on three main tenets: the existence of environmental limits, the linkage between environmental limits and resource consumption ("throughput"), and sharing environmental space on a *per capita* basis (Bühns, 2004; Carley and Spapens, 1998; Hille, 1997; Sachs, *et al.*, 1998).

The 'Contraction and Convergence' (C&C) approach, which also assigns, in principle, an equal *per capita* 'right' to GHG emissions to all people, and expects emissions of all countries to converge to that level by a set date, can be seen as an application of the ES approach. (Kuntsi-Reunanen and Luukkanen, 2006; Meyer, 2000; Najam, *et al.*, 2003; Pearce, 2003). Although initially dismissed as idealistic, there are signs that its political acceptability is growing, in part because there seems to be no other way to bring countries like China and India into the fold of a global climate change regime. Many political and business leaders, including the German Chancellor Angela Merkel, have expressed support for the adoption of a global agreement based on the Contraction and Convergence model, recognising that, in global political terms, it is the most realistic basis for forging international consensus on a post-Kyoto climate change agreement (Global Commons Institute, 2008; Spiegel Online International, 2007).

However, although distributing emission entitlements on an equal *per capita* basis is often regarded as the most just solution, it is not unproblematic (Starkey, 2008). For a start, it does not take the fact, referred to above, that historically high-income countries are

responsible for the larger part of such emissions², and that the people in those countries have benefited from this in the form of economic development and higher standards of living. As GHG emissions are closely intertwined with ‘development’, low-income countries arguably should receive greater entitlements than high-income countries (‘developmental equity’). On the other hand, it can be argued that people living in colder climates (many of which are high-income countries) have a greater need for energy sources to keep warm compared to people in warmer regions. Who has a right to what has been the subject of a long-standing philosophical debate between often conflicting schools of thought, a debate which is unlikely to lead to consensus or agreement on the notion of justice, including environmental justice, especially in an international context, any time soon (Beitz, 1999; Caney, 2002; Dobson, 1998; Miller, 1999; Page, 2006; Rawls, 1999; Rose, 1992; Starkey, 2008).

Given these differences and complexities, it is perhaps not surprising that many of those involved in the debate about the allocation and distribution of GHG emission entitlements adopt the basis of the Equal Per Capita Allocation (EPCA) principle,³ as Starkey notes (Starkey, 2008: 5, 9-12). Thus, although not everyone agrees with the EPCA principle, its simplicity seems to hold growing appeal internationally, if not for pragmatic and political reasons.

But distributing emission entitlements to countries on a *per capita* basis and then leaving it to national governments to further allocate and distribute them within their countries does not necessarily (or at all) guarantee an equitable allocation and/or a reduction of inequality. It is here that the difference between distribution and allocation becomes really important. The question to whom emission rights should be allocated is compounded by the confusion between individuals and states when it comes to distributional justice (Beckerman and Pasek, 1995). In much of the literature about tradable emissions permits it seems to be taken for granted that permits will be allocated to national governments (states), at least initially, who then allocate them within their countries. The most common practice in the GHG trading schemes that have been adopted by governments is to allocate entitlements to the principal emitters, based on past emissions records (the ‘grandfathering’ principle) (Hasselknippe, 2003; OECD/IEA, 2005: 25-27, 121-122). The main reason for this is political-economic: introducing tradable permit schemes based on this principle is economically neutral, or even lucrative, to the main, affected industries, and thereby enhances their political acceptability and feasibility.

Although, in first instance, it may seem reasonable to allocate emission entitlements to those who ‘need’ (to obtain) them, this raises serious objections. First, it implies showering them with significant ‘windfall profits’, given the considerable market value of entitlements, especially if granted for free (OECD/IEA, 2005: 27). Second, it is ethically dubious, to say the least, to effectively reward those who are responsible for causing the (pollution) problem, and for harming environmental (including human) well-being. It can be rightly questioned why polluters should be rewarded for “having invested in environmentally damaging activities?” (Bertram, 1992: 437-438; Bertram, *et al.*, 1990: 14). Third, allocating entitlements to (mostly large) emitters and allowing these to be traded without restrictions may create (or reinforce) monopoly power, and contributes to increasing disparities in wealth and power within countries as well as between countries. The introduction of GHG emissions schemes has been accompanied by the creation of a new range of investment opportunities, including speculation in derivatives (Chicago Climate Exchange; European Climate Exchange; Klaassen, *et al.*, 2005; Korppoo, 2003), creating “a convergence of capital and environmental markets” (*Financial Times*, London, 4 November 1999, quoted in Sinai, 2001). Carbon trading schemes have been characterised by critics as just another form of privatisation and appropriation of the commons, profit making and increasing inequality, and constituting ‘carbon colonialism’ (Bachram, 2004; Pearce, 2008).

However, these objections against carbon trading schemes are no reason for dismissing them altogether. Rather, they emphasise the need for designing schemes in ways that take into account ethical, social and political considerations. It is possible to design carbon trading schemes that *reduce* inequality, and that benefit the poor and communities rather than the rich, and that strengthen the economic basis of democracy. The key, I will argue, lies in allocating entitlements to individuals but to manage these entitlements at the community level.

The more logical step following on from *distributing* emission entitlement over countries on a *per capita* basis, especially if this is done on equity grounds, is to also *allocate* such permits to individuals. If entitlements are distributed between countries on the basis of the argument that all people have an equal right to the use of, or benefits provided by, the atmospheric commons, it seems odd to then *allocate* those rights to only *some* people within countries. Recently, the idea of granting emission entitlements to individuals has been taken up by advocates of domestic tradable permit schemes - DTQs (Fleming, 2007; Starkey and Anderson, 2005; The Foundation for the Economics of Sustainability (Feasta), 2008). DTQs assign a proportion of emission entitlements, for free, to individuals (be it only adults) on an equal *per capita* basis. Emissions that can be attributed

directly to energy use by individuals (in the UK, some 40 per cent), are covered by individual entitlements, while the remainder is tendered to business and government organisations (Fleming, 2007: 9-10). Such a scheme would have the advantage that the costs of reducing emissions would be borne largely by the main energy users (emitters) and by those individuals who exceed their quota, while sparing those on low incomes and offering an incentive to all energy users to minimise their emissions. Although the idea has drawn criticism for being overly complex (Graham, 2004) and DTQs carry higher set-up and running costs than alternative approaches to reducing emissions, they seem technically feasible (Starkey and Anderson, 2005: 2, 31-35).

However, for several reasons, it is preferable to design a scheme that, although formally allocating entitlements (for free) to individuals, does not involve *trade* by individuals. The reasons relate to efficiency, the *collective nature* of the emissions reduction challenge, equity considerations, and the potential advantages of managing entitlements collectively rather than individually.

As already noted above, the transaction costs associated with an emissions trading scheme involving millions of individuals are significant, diminishing their efficiency. Although it has been argued that the higher costs of such schemes are offset by their less tangible benefits, such as involving all people in the challenge of, and responsibility for, controlling emissions, this argument is not very convincing, for the reasons explained below (Starkey and Anderson, 2005: 35).

Involving individuals in trading emission entitlements may be seen a means of involving them in a common purpose, but it also *individualises* the challenge. Sure, individuals, as consumers, can do quite a few things to mitigate or reduce their energy use and emissions, but we cannot depend on such choices for bringing about the infrastructural and systemic changes that are required to make our production, consumption, transport and energy systems (among other) sustainable. For instance, some people may choose to install solar hot water systems, buy 'green' electricity, live close to their work, or use public transport, but the adoption of such solutions by all or even most people (or even making them available to many) requires decisions, and significant expenditure, at the collective level.

Also, it seems doubtful that allowing individuals to trade entitlements would make people feel part of this common challenge. It may just as well reinforce the prevailing emphasis on individual responsibility and approaches, with individual gain (personal cost-benefit rationality) as the main driver for reducing emissions. Moreover, when individuals benefit

from trade, it is quite possible that they will not invest their gains into further reducing their energy use or emissions, but on consumptive purposes. To really involve individuals in the challenge of reducing emissions requires an approach that conceives of individuals as *persons in community*, a view that sees human beings as constituted by (the quality of) their relationships and that acknowledges their mutual interdependence (Daly, *et al.*, 1989: 159-175).⁴ The welfare of each depends very much on that of the community as a whole, and vice versa. This applies *a fortiori* to the issue of climate change, which requires the building or strengthening of collective capacity to deal with sources and (potential) effects on communities as well as individuals. Such a view also implies adopting approaches and seeking solutions that involve people as citizens rather than as consumers.

Allocating entitlements to individuals also does not imply *reducing* inequality, as both rich and poor would qualify for equal entitlements. Although the marginal value of such permits would be greater to the poor than to the rich, ultimately the rich would stand to gain most from allocating entitlements to individuals, especially if trading (and speculation) in permits is allowed. Chances are that the poor would sell whatever they can of their entitlements as they desperately need income to meet their daily needs (Martinez-Alier, 1993; Martinez-Alier, 2002), while the rich can continue their unsustainable lifestyles by simply buying additional entitlements, and might be able to generate potentially big profits from trading large volumes of permits on the market.

The approach favoured here is to allocate formally emission entitlements to all individuals, but to assign responsibility for the management of these entitlements, bundled on a geographical or community basis, to community organisations. Apart from being more equitable than allocating emission entitlements to the major emitters, this also has the advantage of strengthening local capacity to deal with climate change and promote sustainable development. How this could work, I explain next.

Managing entitlements for ‘individuals-in-community’: the role of Community Carbon Trusts

The idea advanced here is that of a scheme that allocates emission entitlements (for free) to individuals, but in which their management occurs, on a community level, by specially designated bodies, referred to here as Community Carbon Trusts (CCTs). Assigning responsibility for the management (including trade) of entitlements to a community organisation is advocated not just to reduce transaction costs; it is also more in line with

the collective nature of the challenge posed by climate change, and has the potential to strengthen the capacity of communities to deal with this challenge, which needs to be seen in the broader context of the need for sustainable development. Giving the responsibility for the management of entitlements to specially designated community bodies rather than general local/regional government organisations also helps to ensure that spending of the revenue from the trading of entitlements is focused on the ultimate objective of reducing emissions and advancing sustainability.

In line with the C&C and ES approaches, the scheme proposed here starts with determining the maximum allowable level of global GHG emissions. This would be divided by the world population, giving the *per capita* amount of GHG (environmental) ‘space’ and entitlement. This space would be distributed across countries based on population numbers (existing or estimated by the target date), determining each country’s ultimate quota. Within countries, GHG entitlements are then distributed by national governments over newly created community organisations (CCTs), with each CCT representing a geographical area that is considered socially and environmentally appropriate (more on which below). Initial emission entitlements are based on existing levels of emissions and population (in line with the C&C approach), but are reduced gradually and steadily (every year or every few years) to reach their ultimate quota by the target year.

Globally agreed designated sources of emissions (companies, organisations, sectors) in all countries must buy emission permits, either from CCTs in their own countries, or on the international market. Carbon banks could act as intermediaries to facilitate trade and reduce transaction costs.⁵ Trading, then, would occur between the major (‘upstream’) emitters, CCTs, and carbon banks. As the amount of available permits gradually contracts, the price of permits rises over time, providing an incentive to emitters to reduce their emissions in the most cost-effective way (so that the marginal costs equal the marginal benefits). Emitters that are not able to reduce emissions will see a continuing increase in the costs of covering their emissions, which will be incorporated into the prices of their goods and services, making these relatively more expensive than less carbon intensive alternatives (such as renewable energy resources compared to fossil fuels). Thus, the incentive to reduce or contain emissions becomes stronger over time.

The main difference between the proposed scheme and that like the EU’s ETS is that entitlements are not allocated to the major emitters, but to community organisations (formally, to all ‘individuals-in-community’). The major differences with the DTQs referred to above is that entitlements are not traded by individuals, and that the revenues

from trading flow to CCTs rather than individuals. Another difference between DTQs and the scheme proposed here is that the latter allows trading to occur internationally, which is not just important from the point of view of enhancing efficiency (Hepburn and Stern, 2008: 271; Tietenberg, 1992b: 50), but a necessity for the scheme proposed here to balance supply and demand. As most of the major emitters (and thus demand for entitlements) are found in high-income countries, but most entitlements would be owned by people in low-income countries (given their larger populations), confining trade within national borders would significantly hamper the opportunities for trade.

Apart from equity considerations, arguably an equally important rationale for adopting the scheme proposed here is that the flow of income that is expected to be derived from selling entitlements by CCTs will significantly strengthen their capacity to deal with the challenges posed by climate change. However, to ensure that this will be the case, two conditions must be met. First, emission rights must be made inalienable in the sense that they cannot be sold indefinitely by CCTs (on behalf of their members), but only on an annual basis. This to avoid that entitlements accumulate in a few hands and increase inequality, as new monopolies are created that only serve their own narrow economic interests (Grubb, 1989: 34), and also to minimise the scope for speculation (which contributes to price instability and adversely affects investment decisions). Second, the revenue derived from entitlements can only be spent on programmes and projects that reduce emissions (mitigation) and/or that assist communities to cope with the effects of climate change (adaptation). The obvious reason for this is to avoid that revenues are spent on projects or measures that increase GHG emissions (such as road building). This condition is a practical application of the idea that the currency by which entitlements are traded should be in the form of projects or measures that contribute to carbon abatement and/or enhancing energy conservation and efficiency (Grubb, 1989: 35).⁶

The importance of strengthening local capacity for promoting sustainable development is widely recognised in the environmental movement and in the literature on sustainable development (Adams, 1990; DeWitt and Mlay, 1999; Durning, 1989; Meadowcroft, 2004; Seyfang and Smith, 2007), while the significance of the role of local government and community-based action is increasingly recognised in the context of combating climate change. Local governments are no longer simply implementers of national policy and have developed approaches of their own (Bulkeley and Betsill, 2005; Bulkeley and Moser, 2007). These developments are most pronounced in the United States, where the failure of the federal government to take forceful action has provoked a raft of initiatives aimed at combating climate change at the state and local level, and where municipalities are said

to be leading the way (Kousky and Schneider, 2003). In several European countries, many local governments have seriously engaged with *Agenda 21*, sometimes with the support from the national level (Lafferty, 2001). In these matters, local governments have also become an international actor in their own right through international organisation and programmes, such as ICLEI and the International Cities for Climate Protection Programme (ICLEI, 2007). Hundreds of local government bodies from the UK, United States, Australia, Canada, New Zealand and other countries have joined the ‘Transition Towns’ movement, which started in Totnes, England, and which aims to enhance the resilience of communities in the face of “twin challenges of diminishing oil and gas supplies and climate change” (Totnes, 2010; TransitionNetwork, 2010).

Although these developments should not be idealised, and local governments and communities are limited in their willingness and capacity to embrace sustainable development and issues like climate change, their significance should also not be dismissed or underestimated (Kousky and Schneider, 2003). Given their key role in urban and regional planning, housing and transport, local governments have a big role to play in advancing sustainability, but are often hampered in doing so by insufficient funding. As combating climate change is now an inevitable and necessary condition for advancing sustainability, requiring the (re-)development of environmentally sustainable urban, energy, transport and other infrastructures and systems, especially at local and regional levels, the transfer of income from emissions trade to this level of government boost the means for sustainable development. It is also badly needed, given the shortage of cash of many local/regional authorities and the enormous expense required for the development of sustainable infrastructures. An emissions trading scheme like the one proposed here provides the basis for a considerable income flow to local government. It increases the capacity for exploiting the potential synergies between the sustainable development agenda and the need to address climate change, especially at the local level (Wilbanks, 2003).

However, local governments are not *inherently* inclined to support sustainable development, and are also prone to being captured by particularistic, short-term, and vested interests. To prevent that, as a result of ‘politics as usual’, the income flow from emissions trading is spent by local governments on projects that increase rather than decrease emissions, it seems best to assign the management of these revenues to separate, independent bodies (CCTs). These bodies should be given the mandate to sponsor only projects and measures that reduce GHG emissions and/or that enhance the capacity of communities to adapt to climate change, *and* that are environmentally sustainable. Thus, CCTs would be able to influence decision-making by local governments, generally

operating under considerable financial constraints, towards the development and maintenance of infrastructure that enhances sustainability. The scheme proposed here does not presume that all local/regional governments take environmental causes seriously, let alone consider these a priority. But tempting them with a considerable pool of money will certainly help.

Thus, the global emissions trading scheme proposed here is not only more equitable than those commonly advanced (based on the 'grandfathering principle' for the allocation of entitlements), but has also the potential to significantly strengthen local capacity for tackling climate change and advancing sustainable development.

Given the limitations of space, and because this is largely a matter for national governments to decide, I will not here elaborate on the specific institutional arrangements involving the creation and functioning of CCTs. I will just make a few observations of general importance.

What are the appropriate geographical boundaries of CCTs is an open question that is best left to national governments to decide, but perhaps based on international guidelines or norms. CCTs could comprise cities with millions of people, or large areas with a relatively small population. In determining their size, governments may want to give consideration to how regions are likely to be affected by climate change, to the capacity needed to mitigate and/or adapt to climate change (including changes to vital infrastructure), population size (which determines the income likely to be derived by CCTs from emission entitlements), social and political affinity or cohesion, the minimization of the chances of mismanagement and corruption, and other.

However, as local government is always subject to the constraints imposed by national governments, and vulnerable to their political interventions, and as CCTs may themselves be prone to mismanagement and corruption, especially if they manage significant amounts of funding, it seems desirable or even necessary to put in place internationally agreed standards for their operation, and a system of independent international auditing. This, of course, might bring up issues of sovereignty, but can be considered as another step in the necessary process of international institution building designed to deal more effectively with the common environmental challenge, and that promotes 'good governance' and accountability.

To ensure that CCTs are and remain responsive to the views, interests and needs of the community that they represent, it is desirable that their governing members are elected by

communities on a regular basis. At the same time, it could be considered desirable to ensure some continuity in the membership of such bodies, for reasons of building expertise, retaining institutional memory, and promoting a longer-term perspective. This could be implemented, arguably, by electing a proportion of the members every two or three years, but for a longer term (of say 10 years).

Although the establishment of CCTs world-wide poses a considerable challenge, it is not impossible. The costs associated with their creation and running could be met from the revenue that they generate. As noted above, there is growing recognition of the essential role of local government in tackling climate change. More generally, from a politically or economically 'realistic' point of view, allocating emission entitlements to communities cannot be dismissed as idealistic. Proponents of tradable permit schemes also often refer to the option of making businesses pay for entitlements, for instance, by auctioning them (Fleming, 2007; Stavins, 2008). Whether the income generated from selling entitlements (on an annual basis) accrues to national or local government makes no difference to emitters. Potentially, revenue could be shared between local and national government, depending on agreed formulae and on where the costs of climate change adaptation and mitigation measures, and the transition to sustainability, are likely to fall. Schemes may start off on the basis of the 'grandfathering' principle, but gradually transfer a growing proportion of emission entitlements to CCTs. Hence, the implementation of the idea advanced here does not imply an 'all or nothing' scenario, but has scope for a being introduced on a step-by-step basis, in line with what is deemed politically feasible.

Conclusion

In recent years, the idea of establishing a global GHG emissions trading system initially advocated mostly by economists, has been gaining support among environmental advocates, businesses and governments. Much of this growing support is based on the perceived economic advantages of such a scheme, which offers governments and businesses opportunities to reduce GHG emissions in the most cost-effective way. Moreover, as granting emission entitlements to emitters based on past emission records ('grandfathering') has become the most commonly adopted basis for allocating emission entitlements, many businesses stand to gain considerably from the adoption of such a scheme. However, allocating entitlements to emitters (polluters) does nothing to reduce inequity within countries; on the contrary, it is likely to contribute to a widening of the gap between rich and poor, the powerful and the powerless. More generally, advocates of emissions trading schemes tend to focus mainly on claimed economic benefits and ignore the ethical, social, and political issues associated with the design of such schemes, in

particular with regard to whom emission entitlements are allocated. This neglect, even if the claimed economic advantages can be achieved, significantly weakens the case for such schemes, possibly to the point that their disadvantages outweigh their potential benefits.

This paper has explored a design of a global GHG tradable permit scheme that is economically efficient, environmentally effective, and ethically, socially and politically acceptable or even attractive to most people. Allocating entitlements to all people on a *per capita* basis, in line with the principles advocated by the C&C approach, and combining this with institutional arrangements that assign responsibility for the management of entitlements to CCTs that represent ‘individuals-in-community’, has the potential to boost the capacity of communities to mitigate and adapt to climate change and to support the transition to sustainable development.

The scheme proposed here is simple in broad outline. It recognises the ecological imperative of reducing anthropogenic GHG emissions. It notionally allocates the environmental (GHG) ‘space’ to all humans in the world on a *per capita* basis, as a (gradually diminishing) quantity of inalienable emission entitlements. It requires the development of fairly straightforward institutional arrangements for these entitlements to be managed by specialised, independent community organisations (CCTs) on behalf of the ‘individuals-in-community’ within their areas. Like all tradable permit schemes, it requires the creation of a national framework for registering and monitoring emissions and trade, and the enforcement of rights and obligations.

Although such a scheme can expect strong opposition from those who stand to lose the unearned profits from the allocation of emissions based on the ‘grandfathering’ principle, the benefits to societies and the world as a whole are much more significant. One would hope and think that this will be sufficient reason for such a proposal to be embraced by political leaders who claim to be committed to advancing the interests of citizens.

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¹ It is important to be clear on these terms, as sometimes the term distribution is used to refer to what I call here allocation, while the term allocation is used for *usage*, for instance with regard to resources (De Jonge, *et al.*, 2001: 31-32).

² High income ('developed') countries are estimated to be responsible for approximately 71 percent of historical/cumulative emissions of GHG emissions from the mid-1850s (Baumert, *et al.*, 2005)

³ This is sometimes referred to as the Equal Per Capita Allocation (EPCA) principle, it may be more appropriate to refer to the Equal Per Capita Distribution (EPCD) principle, as in most (proposed) schemes entitlements are not *allocated* to individuals.

⁴ In this paper, I use the expression 'individuals-in-community' rather than 'persons-in-community' to make explicit the link with the literature and debate on individual entitlements.

⁵ Rules could be adopted to prevent or constrain speculative trade (and profits) in entitlements and their accumulation by institutions, for instance, by levying a tax on trade and by setting limits on the amount of 'banking' and 'borrowing' by the end users of the entitlements, even though allowing a degree of such practices may be desirable to promote temporal efficiency (Tietenberg, 2003: 413).

⁶ One issue that would need to be addressed, too, is whether and to what extent the expansion (or even retention) of carbon sinks adds to the entitlements of communities or countries (and *vice versa*, their destruction to a decrease of entitlements). Limitations of space do not make it possible to elaborate on this point here, but I think there is a strong case for the co-management of sinks (and for sharing the benefits & costs flowing from them) by local/regional communities and national governments.