

How effective can carbon trading be in addressing climate change?



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Introduction

Climate change has variously been described as ‘the most severe problem we are facing today’¹, and ‘a serious and urgent issue’.² There could be ‘a significant drop in the carrying capacity of the Earth’s environment’³, that may ‘bring an end to...advanced civilisation’.⁴ These are not the doomsday calls of marginal environmentalists, but rather the warnings of the UK Chief Scientist, leading economists and Pentagon security analysts. Climate change has now become both big business and high politics.

The world’s response to warnings of this kind has been centred around the Kyoto Protocol, of the UN Framework Convention on Climate Change (UN FCCC). Kyoto requires a five per cent reduction in carbon dioxide emissions in Annex B (developed world) states by 2012, relative to a baseline year of 1990 emissions. The primary mechanism for achieving this reduction is carbon trading, which forms the topic of this dissertation.

Chapter 1 will deal with the logic of carbon trading - its superiority to other market mechanisms, its theoretical underpinnings, and finally its internal operation. Chapter 2 by contrast will concern itself with the broader limitations of carbon trading - including enforcement challenges, the dangers of carbon property rights, and a discussion of whether carbon trading will drive R&D into low-carbon technologies. Chapter 3 will then appraise these limitations in terms of the much broader emissions reduction agenda over the short and long-term. It will convincingly demonstrate that while carbon trading has been heralded as a solution to climate change, its effectiveness in achieving this end will be tempered by political and economic constraints. In the short-term, the priority of cost over environmental integrity means that the carbon trading is acting as a stop gap before

¹ Sir David King, UK Chief Scientist, In: *BBC News* [online] [cited 18/01/2008] <www.news.bbc.co.uk/1/hi/sci/tech/3381425.stm>.

² Stern, N., *The Stern Review: The Economics Of Climate Change*. Cambridge: Cambridge University Press, 2007, p. xiii.

³ Schwartz, P., Randall, S., *An Abrupt Climate Change Scenario And Its Implications For United States National Security*. Pentagon Report, October 2003, p. 1.

⁴ See, M., *Greenhouse Gas Emissions: Global Business Aspects*. London: Springer, 2001, p. xix.

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alternative measures can be implemented. As such it has minimal environmental worth of itself, but represents a marked step forwards for a global economy that is inherently carbon intensive. Over the long-term, it is likely that trading will help to establish normative behaviour in the international system that will be both increasingly climate friendly and be at least sensitive, if not sympathetic to issues of equity. On the other hand, it is unlikely to be of significance in ensuring the economic rise of the global South is low carbon, nor will it add significantly to wider carbon reduction initiatives when these have been implemented. This chapter will then conclude that while carbon trading represents a useful and possibly crucial step forward, in itself it will prove ineffectual in addressing climate change.

On a wider level, this dissertation will critique the technical, policy-prescriptive literature which dominates the current carbon trading debate, favouring instead to more fully link trading with the ultimate environmental goal of a low carbon world economy. It draws from an underdeveloped literature, and far more work needs to be done on the transition from trading to either a more extensive scheme and/or other policy mechanisms for the 2012 deadline. For these reasons this dissertation will be neither exhaustive nor conclusive, but attempt to fill a crucial gap in the literature between the policy of today and tomorrows environmental pressures at a time when most voices are concerned only with making Kyoto work. Any mistakes obviously remain my own.

Glossary

AA	<i>Assigned Amounts</i> are the total allowed emissions for a particular signatory to the Kyoto Protocol over commitment period 2008-12.
Annex 1	The countries of the global North, with specific commitments under the FCCC via the Kyoto Protocol . [*] Annex II are countries of the global South, who have no reduction commitment under the Kyoto Protocol .
AOSIS	<i>Alliance Of Small Islands States</i> . Generally call for the most stringent targets for emissions reductions.
Base year	The assigned amounts (AA) are calculated relative to emissions in a given year – the ‘base year’. For most Annex 1 states, this is 1990.
Bubble	A method of redistributing emissions reductions on a regional basis across the EU (ie. ‘the EU bubble’).
CDM	The <i>Clean Development Mechanism</i> , a flexibility mechanism that enables Annex 1 states to invest in non-Annex 1 states to generate CERs .
CERs	<i>Certified Emissions Reductions</i> are credits earned through CDM projects.
COP	The <i>Conference of the Parties</i> within the UN FCCC is the highest body within the Convention.
Credit	A unit added to the emissions of a legal entity , earned through investment in the emissions reduction of another actor relative to a baseline estimate.
EITs	The <i>Economies In Transition</i> , whose growth have significant implications for future emissions trading.
ETS	<i>Emissions Trading Scheme</i> is the market mechanism for emissions trading - of which legal entities are members.
G77	The <i>Group of 77</i> is the main representative group for states of the South, but is highly heterogeneous in its objectives.
IPCC	The <i>Intergovernmental Panel on Climate Change</i> , which provides scientific assessments of climate change for policy use.

^{*} More commonly referred to as ‘Annex B’ states, as they are in this dissertation, to avoid confusion with the numbered ‘Articles’ of the Kyoto Protocol.

Glossary

- JI *Joint Implementation* is the generation of **credits** by one Annex 1 state in another Annex 1 state.
- Kyoto Protocol The 1997 Kyoto Protocol places binding commitments to reductions of carbon dioxide and other greenhouse gases.
- Legal entity Actors within either private or public sphere that have a legal responsibility to conform to state regulation.
- UN FCCC *UN Framework Convention on Climate Change*, in force since 1994.

If carbon trading is the answer, what was the question?

CHAPTER 1

If carbon trading is the answer, what was the question? Mapping the carbon trading debate

Where carbon trading is shown to have emerged as a potentially key policy instrument for emissions reduction

1.1) Why carbon trading?

Carbon trading emerged during the late nineties as a key response to the challenge of climate change. This chapter will outline the theoretical underpinnings of emissions trading, and the historical trajectory of *carbon* trading in particular. To do this it will *first* discuss the relative merits, and ultimate selection of carbon trading against carbon taxation and other alternatives, *second* it will outline the architecture of the emissions trading scheme - including the concept of ‘offset credits’, and *third* it will situate carbon trading within the thematic challenges common to all environmental regimes – namely issues of equity and cost in the liberal freemarket economy. Lastly it will examine the challenges of trading scheme design, such as the inclusion of divergent interests in a world of scientific and technical uncertainty - and see how these factors have influenced the formative years of the European Union Emissions Trading Scheme. From this it will be clear that while carbon trading is a significant attempt at meeting the emissions reduction objectives of the Kyoto Protocol, it has various inherent flaws that pose questions beyond the tenets of the scheme itself.

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First it is necessary to define what is meant by carbon trading. Carbon trading is based on derivatives - an asset that derives its value from something else. These assets are credits or permits held by companies and governments ('legal entities') that allow the holder to emit certain gases – in this case carbon dioxide. The trading concept - 'the buying and selling of emission allowances'¹ - that occurs between legal entities is more complex, and best understood with a hypothetical example. Two legal entities, A and B, both emit 10,000 tonnes of carbon dioxide per year. Both are required to reduce their emissions by a given amount, say 5 per cent, over the next year - which brings their 'allowance' to 9,500 tonnes for that year - the 'cap'. A can do this more cheaply than B, so B pays A to do the reductions for both of them - the 'trade'. A then reduces its emissions by 10 per cent. The tipping point - the push that makes the trade happen, occurs when the cost to B of making the reduction exceeds the cost of paying A to do it for them. This allows the market to find the most cost effective way of reducing emissions. The four 'basic elements of any trading program are [therefore] binding caps on emissions, a clearly defined trading unit and a trading period', while there must also be a clear definition of the actors who are to achieve the caps.²

The Kyoto Protocol established the framework within which such a market could be justified, designed and implemented. 'The Kyoto Protocol outlines institutions for monitoring emissions, sets targets and outlines trading or 'flexibility' mechanisms to ease the implementation of these targets.'³ According to Article 17 of the Protocol:

The Conference of the Parties shall define the relevant principles, modalities, rules and guidelines, in particular for verification, reporting and accountability for emissions trading...Any such trading shall be supplemental to domestic actions for the purpose of meeting quantified emission limitation and reduction commitments under that Article.⁴

¹ Grubb, M., Vrolijk, C., Brack, D., *The Kyoto Protocol: A Guide And Assessment*. London: Earthscan, 1999, p. xxix.

² Kerr, S. (ed), *Global Emissions Trading: Key Issues For Industrialised Countries*. Edward Elgar Publishing: Cheltenham, UK, 2000, p. 12.

³ Kerr, S. *ibid.*, p. 1.

⁴ - *The Kyoto Protocol Article 17*. [online] [cited 15/11/07]
<<http://unfccc.int/resource/docs/convkp/kpeng.pdf>>.

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But why did emissions trading emerge as the preferred policy response for implementing Kyoto? The economist Kosobud describes the decision making process that ends with a scheme such as carbon emissions trading as being comparable to a ‘decision tree’. ‘The rooted trunk of the decision tree represents the recognition of an environmental problem...The first branching of the tree represents the choice of mitigating the harms either by private negotiation, government intervention, or doing nothing at all if the costs of mitigating are too high.’ In the climate change debate, the scale of the issue means that some level of government intervention is necessary. ‘Proceeding then, along the government intervention branch, which in effect assigns air rights to the public, brings us to the next fork where the question of the appropriate extent or efficient degree of such intervention is to be answered.’⁵ Should this intervention be centralised or decentralised? Two key options exist – taxation or trading.

Rivals in the hothouse: Taxation versus trading

There are a number of reasons why trading is considered to be superior to taxation in the implementation of the Kyoto targets. ‘The roots of an emissions trading system is based upon the advantages it would offer as compared to other politically feasible alternatives.’⁶ It is important however to first recognise that both have similar advantages. Both systems give pollution a price, thus internalising the cost to the environment. In principle, this price would encourage emitters to reduce their emissions just the same, regardless of whether it was because of a tax or a trade.⁷ *The Economist* simplifies the comparison thus:

In the neat world of economic theory, carbon reduction makes sense until the marginal cost of cutting carbon emissions is equal to the marginal benefit of cutting carbon emissions. If policymakers knew the exact shape of these cost and benefit curves, it would matter little whether

⁵ Kosobud, R. (ed), *Emissions Trading: Environmental Policy’s New Approach*. New York: John Wiley & Sons, 2000, pp. 5-6.

⁶ Tietenberg, T., *Environmental Economics And Policy* (5th Edn). Boston: Pearson Education, 2007, p. 324.

⁷ There are significant debates between the technical effectiveness of taxation versus trading schemes that are better explored elsewhere. For the purposes of this chapter, it is necessary to look beyond hypothetical economics and explore the complex political reality that ultimately determines the outcome of any scheme.

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they reached this optimal level by targeting the quantity of emissions (through a cap) or setting the price (through a tax).⁸

In reality, there are political, as well as potential moral reasons why trading is desirable over taxation. This works in two dimensions – the domestic and the international field. *First*, trading is more politically acceptable than taxes for policy makers. Taxes encourage a relatively centralised command system, while trading suggests a more diffuse system in line with neo-liberal economics. This belies an inherent tension in green politics, between change through command mechanisms and through more egalitarian systems.⁹ There are further advantages to trading. Trading addresses the issue of uncertainty better, with limits placed on emissions and better flexibility given the limit will change over time. Taxes don't have this political advantage. This is because taxes require the 'unfavourable impact of resetting rates when circumstances change.'¹⁰ Combined with this, politicians find it easier to justify the logic of a cap and trade scheme. 'It is intuitively easier to grasp how a carbon cap will slow global warming.'¹¹ In states such as the US, should they rejoin Kyoto, the generally negative disposition to taxes (and the way they encourage prices to be passed directly on to the consumer) has been used as a justification against taxes, despite consumer price increases occurring regardless of whether it is a trade or a tax. There is a more substantive political argument for business in that they will have to seemingly pay twice – once for the tax, and once for the actual reductions themselves (although the more is spent on reductions, the less will go on tax!). There is also the dimension that political support can be encouraged through the giving out (or 'grandfathering') of allowances, thus making the scheme more attractive to business.

Second, there are the dictates of ensuring enthusiasm and compliance across the competitive international field (see Chapter 2). States are unlikely to express interest in making payments to some centralised global authority without very good justification. 'It

⁸ - Economics Focus: Doffing The Cap. *The Economist*. June 16 2007, p. 90.

⁹ This is a simplification, but it is sufficient to say there is a tension around the distribution of power in environmental politics between different political systems that have the same goal. See for instance: Radcliffe, J., *Green Politics: Dictatorship Or Democracy?* Palgrave: Basingstoke, 2000.

¹⁰ Kosobud, R. (ed), *op cit.*, p. 14.

¹¹ - *The Economist. op cit.*, p. 90.

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seems somewhat unrealistic to envisage the emergence of an international carbon tax scheme, in which countries would pay conceivably large amounts of money to an international greenhouse agency in proportion to their greenhouse gas emissions.¹² On the other hand, trading has no such stigma attached. Trading is more opaque than taxation, allowing politically sensitive issues to be covered over; ‘rich countries can pay poorer ones to cut their emissions without any cash changing hands between governments. Under a carbon tax such transfers must go through government’s budget...However sensible it sounds to an economist, American voters may be loth to see their tax dollars funding fat checks for China.’¹³ It is not so much the *notion* of financial flows between states – globalisation has ensured this – but more that the scale of transfers may be substantial and conflict with other foreign policy objectives.¹⁴ A trading scheme makes such issues more diffuse.

Architecture of a hybrid system

Under the Kyoto Protocol, legal entities within Annex B states are allowed to purchase credits generated abroad. The investment generated is put into low emissions sustainable development projects which require initial investment to get off the ground. Such projects reduce carbon emissions that would otherwise have taken place - for instance investing in renewable energy technology that replaces a coal powered electricity plant or building methane burners at a waste dump. These schemes do not reduce emissions themselves, but rather limit emissions that would have otherwise taken place had the investment not been provided. This maximises efficiency and minimises cost, as the emissions reduction occurs wherever it is cheapest to do so. Two options exist – the Clean Development Mechanism (CDM) for reductions in non-Annex B states, and Joint Implementation (JI) for reductions in other Annex B states.

¹² Fankhauser, S., *Valuing Climate Change: The Economics Of The Greenhouse*. London: Earthscan, 1995, p. 109.

¹³ - *The Economist. op cit.*, p. 90.

¹⁴ Jiang extends the Chinese example arguing that states like China have significant financial opportunities through carbon trading. See: Jiang, T., *Economic Instruments Of Pollution Control In An Imperfect World: Theory And Implications For Carbon Dioxide Control In China*. Cheltenham: Edward Elgar, 2003, p. 230.

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First there is the *Clean Development Mechanism*, where industrialised countries receive credit for funding low emissions projects in the developing world. This has two functions: 1) it reduces the cost of emissions reduction by allowing the reductions to take place in the cheaper South, and 2) it assists international development by channelling resources from more developed to less developed states. ‘The purpose of the clean development mechanism shall be to assist Parties not included in Annex 1 in achieving sustainable development and in contributing to the ultimate objective of the convention’.¹⁵ This is to be contrasted with *Joint Implementation*, where two Annex B states are both able to claim credit for initiatives they undertook in specific joint projects. ‘Joint implementation schemes essentially enable high abatement cost countries to be credited for (cheaper) abatement or sequestration efforts undertaken abroad.’¹⁶

These additions to the standard emissions trading scheme allow greater flexibility in meeting the Kyoto targets, while still keeping the spirit of emissions trading. ‘Country A undertaking abatement in country B under a [JI or CDM] scheme is conceptually similar to country B selling emission permits to country A.’¹⁷ Two factors are necessary for these mechanisms to fit seamlessly into the main trading scheme: 1) the scheme has to be multilateral and encompass a significant number of emitters and 2) there has to be a defined emissions target for each state (or in the case of the CDM adequate compliance and enforcement tools) – as laid out in Article 17.

1.2) The logic of the market

Carbon trading assumes that as a market-created issue, it necessitates a market based solution.¹⁸ As Kerr makes clear, ‘emissions are critically related to economic activity’, and as such require significant controls on the market to ensure that the political objective

¹⁵ - *The Kyoto Protocol Article 12*. [online] [cited 15/11/07]
<<http://unfccc.int/resource/docs/convkp/kpeng.pdf>>.

¹⁶ Fankhauser, S., *op cit.*, p. 109.

¹⁷ Fankhauser, S., *ibid.*, p. 109.

¹⁸ A ‘market-based instrument (MBI) approach to environmental policy makes use of the market-place, by modifying market signals in order to induce more environmentally friendly behaviour.’ Turner, K., Pearce, D., Bateman, I., *Environmental Economics: An Elementary Introduction*. Hemel Hempstead, England: Simon And Schuster, 1994, p. 181.

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of emissions reduction is met.¹⁹ While the market is of course central to this issue, it is also important to situate the role of the market within the broader field of politics, and within international environmental politics in particular. On a general level

...most environmental problems are closely related to the generation and distribution of wealth, knowledge, and power, and to patterns of energy consumption, industrialization, population growth, affluence, and poverty.²⁰

Because of this complexity, and the centrality of carbon to the world economy, designing an efficient market mechanism is problematic. According to Kosobud, divergent 'public and private interests are more intertwined than in most other markets and therefore green markets are likely to be more intricate in their evolution than other types.'²¹ This complexity, according to market champions, can only be addressed by the integration of business and government spheres.

Under emissions trading regulation, business and government share the commanding heights of environmental policy. The former is free to trade emission rights or to choose, and to develop, air pollution control measures with the incentive in mind of minimizing control costs. The latter reserves the right to set emission rates or aggregate levels of pollution under which tradable rights can be generated, to establish trading rules, and to monitor and enforce compliance with the incentive in mind of increasing public welfare.²²

The most significant influence that this brings to regime construction is an assumption of continued and significant growth. This issue will be dealt with more substantially in Chapter 2, but it is worth mentioning here. Given the predominance of business interests within the climate change discourse, it is unlikely that any other outcome was conceivable within the Protocol. As Tietenberg points out, the dominant discourse of all climate change policies turn around minimising economic damage: 'the effect of

¹⁹ Kerr, S. (ed), *op cit.*, p. 7.

²⁰ Greene, O., Environmental Issues. In: Baylis, J., Smith, S., *The Globalisation Of World Politics: An Introduction To International Relations (3rd Edn)*. Oxford: Oxford University Press, 2001, p. in Baylis and Smith, p453

²¹ Kosobud, R. (ed), *op cit.*, p. 16.

²² Kosobud, R. (ed), *ibid.*, p. 3.

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controlling climate change is to slow growth, not to stop it or reverse it.’²³ Carbon trading does not seek to ‘stop’ emissions completely, but more to provide the incentives necessary for significant reductions. It does not sell itself as a solution for climate change – recognising implicitly that this is a challenge so substantial that any solution will only *help* the situation, not address it entirely. Less mainstream concepts such as the steady state economy and zero growth have minimal impact on international agenda setting.²⁴

It is within this discourse of a market solution that we must situate the significant potential of carbon trading: in meeting the Protocol targets, in minimising cost, and in ensuring equity. *First*, the effectiveness of an emissions trading scheme is two-fold: static (short-term) and dynamic (long-term) gains. *Static* gains are the immediate gains of a trade – that an emission reduction takes place while maximising efficiency. *Dynamic* gains are less tangible but of greater significance for the long-term workability of the Protocol. The cost dimension acts as a driver for the adoption of efficient technologies, increasing investment and the ‘level and effectiveness of spending on research and development.’²⁵ If carbon has a price, then this will push companies to invest in alternatives. To use the wind-power example: ‘a \$50 per ton carbon price means that wind power will be quite close to competitive with fossil fuels...it will stimulate investment needed to make wind competitive.’²⁶ This has considerable purchase, as legal entities are forced to invest in better technologies as they use up their permits. If a ‘firm takes no positive action other than buying permits or credits indefinitely, then it is certain to incur huge financial losses as a result of higher production costs.’²⁷ Most legal entities will be encouraged to lower emissions. Such effects will, it is argued, turn into a virtuous

²³ Tietenberg, T., *op cit.*, p. 324.

²⁴ For a discussion of how low growth economies would work in practise in relation to the Kyoto targets, see Victor and Rosenbluth. Using LOWGROW, a dynamic simulation model to forecaste varying dimensions to Canada’s economy, including employment, poverty, and meeting environmental regulations, these authors find that growth across the global North is insignificant and potentially harmful to meeting other targets. See: Druckman, A., et al., Measuring Progress Towards Carbon reduction In The UK. *Ecological Economics*. 2007, pp. 1-11.

²⁵ Kerr, S. (ed), *op cit.*, p. 14.

²⁶ Goodstein, E., Prices Versus Policy: Which Path To Clean Technology? In: Hall, D., Howarth, R. (eds) *Advances In The Economics Of Environmental Resources Vol III: The Long-Term Economics Of Climate Change: Beyond A Doubling Of Greenhouse Gas Concentrations*. Amsterdam: Elsevier Science, 2001, p. 235.

²⁷ See, M., *Greenhouse Gas Emissions: Global Business Aspects*. Heidelberg: Springer, 2001, p. 182.

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cycle, with positive repercussions across the low emissions technology base. Trading will increase state commitment and vitally the ‘credibility of *future* commitments.’ [italics added]²⁸

Second, and related to both static and dynamic gains, is the issue of cost. As a market response, this is a joint priority to the achievement of the reduction target, acting as an incentive for actors to reduce emissions. There *needs* to be this incentive creation if a government is not opting for a command and control measure. From a legal entities point of view:

A climate policy instrument makes sense economically when it leads to a reduction in emissions such that the benefit and cost of an additional unit of emission reduction (marginal benefit and marginal reduction cost) are equal.²⁹

The efficiency of trading therefore lies in its ability to provide the lowest cost solution to the legal entity while also meeting the reduction target of the state. ‘Under perfect market conditions, trading can achieve the environmental goal at the lowest possible cost.’³⁰

Considering the challenges of achieving consensus in the international field, this insistence on the cost of implementation is crucial to ensuring targets are met. All Annex B parties to the Protocol agree to this principle – for obvious reasons. For example, the introduction to a US carbon trading paper argues that ‘[o]ne general area of agreement...is that if steps are taken to reduce emissions, they should achieve those reductions at the lowest possible cost.’³¹ There are also incentives to a scheme such as emissions trading – with substantial economic gains to be made if sufficient effort is put into research and development goals. There is also substantial money to be made from the trading process itself. The international community has ‘created what might well emerge

²⁸ Kerr, S. (ed), *op cit.*, p. 14.

²⁹ Michaelowa, A., Flexible Instruments Of Climate Policy. In: Michaelowa, A., Dutschke, M., (eds). *Climate Policy And Development: Flexible Instruments And Developing Countries*. Cheltenham: Edward Elgar Publishing Ltd, 2000, p. 5.

³⁰ Kerr, S. (ed), *op cit.*, p. 13.

³¹ - *CBO Who Gains And Who Pays Under Carbon-Allowance Trading? The Distributional Effects Of Alternative Policy Designs*. Congressional Budget Office, [online] [cited 05/01/2008] <<http://www.cbo.gov>>.

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as one of the world's largest traded assets - an entitlement to emit greenhouse gases - as an entirely artificial construct: a market to control the biggest by-product of the world's market economies'.³²

Third, and equally significant, are the general challenges of trading scheme design that are true of environmental regime construction in general – namely the interrelated issues of ownership and ensuring equity.

Turning to the issue of ownership raises two important and related questions. These are '*who is responsible* for climate change and therefore *who should act on it?*' The former is a loaded question. It is very difficult to know who should be held 'responsible', as carbon emission is structurally integral to modern energy and technology intensive economies – or to put it another way, it is difficult to see who *shouldn't* be held responsible. It is nonetheless necessary to identify a group (or groups) who should be held accountable within the overall structure of society if the 'tragedy of the commons' is to be prevented.³³ Consider this hypothetical example in a popular International Relations text:

[Imagine] a sea...on which many local fishing communities depend...Each fisher has an immediate interest in making as large a catch of fish as possible [and] this arrangement works satisfactorily...Gradually however, living conditions improved and human populations grew, increasing the number of people fishing and also the demand for fish. At the same time, fishing technologies improved. In recent years, the sea...has been fished at unsustainable levels, and the total fish stock is falling.³⁴

In the example, it is difficult to isolate one particular actor, or actors, who should be held responsible for preventing the collapse of the fish stocks. Is it the fishermen who catch the fish, or the extra mouths that require food? What are the alternative sources of food, if

³² Such rarefaction of the cost imperative does not come without its consequences. As shall be seen in Chapter 3, this obsession with placing cost on equal standing with the achievement of the Protocol reduction targets poses challenges for future policy construction over the medium to long-term. Grubb, M., Vrolijk, C., Brack, D., *The Kyoto Protocol: A Guide And Assessment*. London: Earthscan, 1999, p. 210.

³³ Proposed originally and most coherently by Garrett Hardin. See: Hardin, G., *The Tragedy Of The Commons*. *Science*. 1968, Vol. 162, p. 1243-8.

³⁴ Baylis, J., Smith, S., *op cit.*, p. 459.

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any? In the same way, who is responsible for climate change when emissions are intertwined with human activity?

While acknowledging the requirement for state leadership and enforcement, carbon trading seeks to target the main emitters directly – industry in the global North.³⁵ Crucially, the rapid dispersal of greenhouse gases means that it does not matter where the reduction takes place, as long as the reduction does occur somewhere. An example of this is the E.U ‘Bubble’ where under the terms of the Protocol, the EU has a fixed overall reduction of eight per cent. Such a ‘region-specific’ flexibility mechanism allows member states to distribute emission targets amongst themselves as long as the overall reduction is reached. With the aggregate total emissions determining the level of *forcing*, not who does the emission or where the emission takes place, it is inconsequential whether that reduction takes place by those directly responsible or by another legal entity. In practise, this means that the *problem* of the ‘tragedy of the commons’ is solved – in that if an actor is found responsible, there is no requirement for this actor to be unnecessarily compromised in their economic performance over any other actor, if that actor can have their reductions undertaken for them. This is burden sharing at its most effective. Naturally the CDM and JI enable even greater flexibility for the outsourcing of emissions reductions.

Strongly linked to the idea of diffuse ownership of the problem is the idea of equity. Carbon trading shouldn’t privilege one state over another. According to Wiegandt, ‘perceptions of justice are an integral part of the design of climate change policy, which seeks to alter human influence on atmospheric processes without further aggravating differences in welfare among different countries and social groups.’³⁶ This is most obviously the case with the CDM, which in principle provides significant financial assistance for the underdeveloped world to meet its development needs both

³⁵ It is expected that over the medium to long-term there will be inclusion both of other regions with economic development and possibly of non-industrial sectors.

³⁶ Wiegandt, E., Climate Change, Equity, And International Negotiations. In: Luterbacher, U., Sprinz, D., (eds). *International Relations And Global Climate Change*. Cambridge: The MIT Press, 2001, p. 147.

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technological and financial.³⁷ This is to address the inequity between the North, who are responsible for the bulk of emissions, and the South, who will bear the consequences along with the North for a problem they are largely not responsible for. It is this principle – that the polluter should pay, (in this instance for the greening of the South) that underpins the market as being a viable solution. At this point the cost has moved from being diffuse across the international system and into the hands of those deemed ‘most responsible’ for the damage (and most able to pay).

The Protocol can therefore be used to improve equity between states,³⁸ although concerns exist regarding the distribution of CDM projects between developing states and the associated tendency for economies in transition (EITs) to benefit disproportionately from CDM opportunities.³⁹ It is important however to keep the overall objective of emissions reductions foremost in the construction of a trading scheme. One author warns that as the primary focus is emission reduction, spin off benefits should be treated with some caution: ‘climate change policies should not aggravate existing disparities between one region and another, nor attempt to redress all equity issues’.⁴⁰ Unlike in the CDM, there is no comparable sense of equity in the standard emissions trading schemes, other than state responsibility to reduce the impacts of domestic emissions activity on other states.⁴¹

This transboundary responsibility links back to Principle 21 of the 1972 Stockholm Conference, which stipulated ‘that states...do not cause damage to other states...beyond

³⁷ Nor should it conflict with more the more general agenda of sustainability – ‘established to assist developing countries in achieving economic, social, environmental and ‘sustainable’ development objectives while reducing GHG emissions. Mendis, M., Openshaw, K., *The Clean Development Mechanism: Making It Operational. Environment, Development And Sustainability*, 2004, Vol. 6, no. 2, p. 190.

³⁸ Sachs, W., Loske, R., Linz, M., *Greening The North: A Post-Industrial Blueprint For Ecology And Equity*. London: Zed Books, 1998, p. 212.

³⁹ See in particular discussions surrounding Africa’s poor ability to attract CDM projects relative to EIT states of South-East Asia and South America. Grubb, M., Vrolijk, C., Brack, D., *op cit.*, pp. 238-9.

⁴⁰ Michaelowa, A., Flexible Instruments Of Climate Policy. In: Michaelowa, A., Dutschke, M., (eds). *op cit.*, p. 3.

⁴¹ I.e a reduction in emissions, because the notion of domestic and international emissions is irrelevant for carbon dioxide vis-à-vis climate change. Wiegandt, E., *Climate Change, Equity, And International Negotiations*. In: Luterbacher, U., Sprinz, D., (eds). *op cit.*, p. 138.

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the limits of [their] national jurisdiction'.⁴² States who do not comply with this responsibility, but who rely on others to make the emissions reductions, are *freeriding*. Game theory would suggest that such self-interested action is the most effective method for the *individual* state actor, but it is not the most effective if suspicion prohibits serious action on the part of the other actors, and therefore prevents a target being met.

1.3) Different perspectives, different agendas

Past experience with emissions trading

Experience with previous examples may be grouped into two types. *First*, there have been a number of cap-and-trade schemes in operation since the 1970s, and a number of emissions trading schemes in particular. These however, have never been scaled up to the size of the proposed carbon dioxide trading schemes. As Kerr points out, 'Although a number of successful domestic markets have operated for many years we have no significant international examples.'⁴³ Given this inexperience with large scale schemes, design simplicity is paramount, as complication makes both compliance and verification more difficult. Kerr compares two examples. In the US sulphur dioxide trading scheme, regulations were simplified to treat the pollutant as uniformly distributed (and hence inconsequential where it is produced), thus saving the need for complicated weighting of trades within high production zones. Although the science would not have supported such a decision, it made the programme easier to manage, and hence a success. By contrast, in New Zealand the individual quota program for fisheries used a complicated banking and trading mechanism that rendered the system difficult to manage in terms of compliance.⁴⁴ The lesson, as Stavins makes clear, 'is to keep it simple and keep it flexible.'⁴⁵ In the 'Montreal Protocol on Substances that Deplete the Ozone Layer', this simplicity was ensured by a relatively small number of players, a non-essential substance under trade, and did not involve states with suspect compliance attitudes. In the case of a carbon

⁴² - Declaration Of The United Nations Conference On The Human Environment, Stockholm 1972. [online] [cited 3/11/2007]

<<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97&ArticleID=1503>>.

⁴³ Kerr, S. (ed), *op cit.*, p. 3.

⁴⁴ Kerr, S. (ed), *ibid.*, p. 23.

⁴⁵ Stavins, R., What Do We Really Know About Market Based Approaches To Environmental Policy? In: Kosobud, R. (ed), *op cit.*, p. 55.

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emissions trading scheme, none of these advantages are in place: there are potentially a plethora of players, an economically integral substance under trade, and a substantial number of states where compliance and enforcement could pose serious challenges.⁴⁶

Second, what lessons have been learnt from the earliest days of the European Union Emissions Trading Scheme (EU ETS)? As the first and the largest carbon dioxide trading scheme in the world, the EU ETS covers half of the EU's current emissions.⁴⁷ Starting on 1st January 2005, it now comprises of over 12,000 installations in all EU member states covering six industrial sectors. The early experience of the scheme has been mixed – while high compliance has improved overall confidence in the scheme, the market collapsed in 2006 due to an excessive number of allowances being issued. Too many permits and their price drops – making the cost of reductions high relative to the benefit gained from being able to trade. Allowances will therefore be reduced for the next trading period (Phase II 2008-12). There are other improvements in design, such as a more stringent application process for the next trading period. So far, the European Commission has dismissed many state plans for Phase II trading, saying that they are insufficient in meeting overall reductions. This will be backed up with a more significant compliance mechanism – in the form of a fine per carbon tonne emitted outside of the trading scheme. For Phase II trading, this will be €100 per tonne of carbon dioxide, a significant increase on the €40 per tonne fine levied during Phase I.⁴⁸

Actors

It is important to mention in any discussion of the operation of such schemes, that there are multiple actors with an influence both in the design and operational phases of a scheme. More generally:

⁴⁶ See Chapter 2 for a discussion of the problems of enforcement.

⁴⁷ - *The European Union Emissions Trading Scheme: Insights And Opportunities*. The Pew Center On Global Climate Change [online] [cited 14/11/07] <<http://www.pewclimate.org/docUploads/EU-ETS%20White%20Paper.pdf>>.

⁴⁸ - *The European Union Emissions Trading Scheme: Insights And Opportunities*. The Pew Center On Global Climate Change. *ibid*.

If carbon trading is the answer, what was the question?

In climate politics, as in everything else, different sides have different stakes, different vulnerabilities, different backgrounds, different commitments, different interests and different kinds of power.⁴⁹

At least three roles can be identified. By far the most prescriptive, regulatory role lies with the government. This actor can both be 1) a ‘trader’ in a scheme (because they create their own emissions, and if they choose, they can trade on behalf of their legal entities on the international stage), and 2) set up the regulatory framework for their legal entities to trade by themselves while keeping within a specified cap. They then switch to a policing role to ensure legal entities keep to the regulations. ‘This essentially requires ensuring that at the end of the commitment period all entities will have sufficient AAUs to cover their cumulative emissions.’⁵⁰ This is not to say that all states are born equal within the trading scheme. Their interests can be divided into two camps, that also match geographical distinctions. There is a clear distinction between the North, backed by powerful corporations, which is attempting to produce solutions to climate change that allow it to continue its political and economic hegemony, while the South is more interested in ensuring its own economic development.

The *second* set of actors is that of the private sector. These are the main source of emissions within Annex B states. As such, their role is both within emissions reductions and R&D. ‘Individuals, firms and corporations can change emissions by changing consumption, input and production patterns, changing processes, investing in technology that lowers emissions, and carrying out research and development that can lead to lower emissions in the future...The main aim of the international agreement is to induce them to do these things’.⁵¹ The private sector also has an important regulatory role, by enforcing trading behaviour. If one firm is being treated unfairly, it will make itself known to regulatory bodies. For instance, in the Montreal Protocol, fabrics manufacturer DuPont felt that it was losing competitive advantage to EU competitors, who were not bound by the same limits on their CFC emissions. As a response, DuPont put pressure on

⁴⁹ Lohmann, L., *Carbon Trading: A Critical Conversation On Climate Change, Privatisation And Power. Development Dialogue*. Uddevalla, Sweden: Mediaprint, no. 48, 2006, p. 338.

⁵⁰ Kerr, S. (ed), *op cit.*, p. 17.

⁵¹ Kerr, S. (ed), *ibid.*, p. 17.

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governments on both sides of the Atlantic for more stringent controls across the board and hence greater equity. This internal policing of the system encourages compliance, which ensures the continued value of permits. Conversely the perils of lax enforcement are shown by the Chilean total suspended-particulates market where insufficient enforcement spelt the collapse of the system as companies didn't comply.⁵²

The final group are NGOs. These fall into two broad, and often interchangeable camps. *First*, there are those NGOs that act as policy focused think-tanks, and often represent diverse viewpoints both environmental and business orientated.⁵³ *Second*, there are the campaign orientated NGOs such as Greenpeace, and the World Wide Fund for Nature, who have influence over both regime design and implementation. Such action has two dimensions - directly to the trading scheme itself and also indirectly through affecting wider public opinion. Thus far, the influence of this group has remained largely potential, with minimal tangible input from NGOs on the specifics of the scheme design, matched with a low campaign profile towards the general public due to the issues complexity.⁵⁴ NGOs may however be effective in identifying those not in compliance with a scheme, and so far have been active in certifying JI and CDM projects.

Uncertainty

With a multiplicity of actors with different (and sometimes contradictory) agendas, it is crucial that the nexus between science and politics remains transparent and unbiased. Given the uncertainty of climate change science, the scientific community needs to be able to present latest findings in what is seen to be an objective manner. To address this issue, the World Meteorological Organization (WMO) set up the Intergovernmental Panel on Climate Change in 1988, to provide scientific data applicable for policy use.

Beyond the issues of transparency and hard self interest, there are three areas of uncertainty within climate change science and policy. As Helm lists: 'the cause effect

⁵² Kerr, S. (ed), *ibid.*, p. 10.

⁵³ See for instance: The Pew Center on Global Climate Change <<http://www.pewclimate.org>>, and The Corner House <<http://www.thecornerhouse.org.uk>>.

⁵⁴ While NGO influence is increasing, decision making powers remain the preserve of Government bodies.

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relationship between pollutants and environmental damages...the costs of environmental damages or, conversely the potential benefits of mitigation and adaptation measures [and]...the effectiveness and costs of different mitigation and adaptation measures'.⁵⁵ Kerr further refines the latter two 'human-side' dimensions to this uncertainty, arguing 'the causes of economic uncertainty include potential new technologies, uncertainty about paths of economic development, and the timing and extent of human behavioural responses to regulation.'⁵⁶ The Protocol does not, and cannot, address these issues directly.⁵⁷ Indirectly, however, the problems thrown up by uncertainty can be addressed by acting on the basis of a worst case scenario – that is, applying the 'precautionary principle'.⁵⁸ From a market perspective, this is a product of aversion to risk – which stems from fears of the potential irreversibility of environmental damage.⁵⁹ Tietenberg again:

it makes sense to take action now to reduce emissions of greenhouse gases in order to provide insurance against adverse, possibly irreversible consequences if the damage tends to be higher than anticipated.⁶⁰

1.4) Conclusion

As has been shown in this chapter, carbon trading is a key policy tool that has emerged in response to the challenge of climate change. It represents the latest stage in a fundamental shift from the laying of targets, to better use of available technology for serious emissions reduction. Theory suggests that carbon trading minimises the cost of this process, and maximises efficiency.

⁵⁵ Helm, C., *Economic Theories Of International Environmental Cooperation*. Cheltenham: Edward Elgar Publishing Ltd, 2000, p. 123.

⁵⁶ Kerr, S. (ed), *op cit.*, p. 6.

⁵⁷ The Kyoto Protocol text only mentions uncertainty twice - in relation to uncertainties of sink accounts and uncertainties of climate science. - *The Kyoto Protocol Article 3 & 10*. [online] [cited 15/11/2007] <<http://unfccc.int/resource/docs/conykp/kpeng.pdf>>.

⁵⁸ The precautionary principle states that scientific uncertainty in matters which may negatively affect public or environmental wellbeing may not be used as an excuse for inaction. See: Elliot, L. *The Global Politics Of The Environment (2nd Edn)*. London: Palgrave Macmillan, 2004, pp. 144-5.

⁵⁹ Helm, C., *op cit.*, p. 124.

⁶⁰ Tietenberg, T., *op cit.*, p. 324.

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This is based on the substantial assumption that the Kyoto targets represent a meaningful reduction in emissions to avoid catastrophic climate change. This is not the case. Even supporters of Kyoto, such as former UK Prime Minister Tony Blair see its flaws:

even if we could deliver on Kyoto, it will at best mean a reduction of 1 per cent of global warming. But we know...we need a 60 per cent reduction [in carbon dioxide emissions] worldwide. In truth, Kyoto is not radical enough.⁶¹

How does carbon trading fit into this ‘radical’ change? Does carbon trading as it stands now provide the foreground for more significant emissions reductions in the future? Does the priority of the market mechanism – cost – marry well with the priority of the IPCC – emissions reductions? Is emissions trading not mistaking financial priorities for environmental and political ones? As will be shown in the next chapter, ‘Emissions trading...does not represent a long-term solution to global warming, but allows companies time to offset...costs.’⁶² At the birth of the EU ETS and the potential for a truly global scheme it is important to recognise why this represents such a significant step forward and what consequences it will have for the future.

⁶¹ Former UK Prime Minister, Tony Blair quoted in: Gelbspan, R., *Boiling Point*. New York: Basic Books, 2004, p. 127.

⁶² See, M., *op cit.*, p. 182.

CHAPTER 2

Limitations of carbon trading: Challenges & tensions

Where potential operational challenges to carbon trading are explored

2.1) A step forward

In Chapter 1 it was explained that carbon trading represents a significant step forward in reducing emissions. It was explained that given the limitations of a market based, politically feasible scheme with global reach, carbon trading is desirable over alternatives. This analysis was based within the confines of a policy-prescriptive framework - attempting to meet a defined market objective (a five per cent reduction in emissions) at lowest cost. The fact it was an environmental objective is irrelevant. This chapter by contrast, will examine critiques of carbon trading - attempting to add to the rather limited perspectives of most cost-obsessed economic analysis with a clearer sense of the non-cost implications that will come into play over the medium to long-term. It will argue that although carbon trading represents a powerful tool for meeting the Kyoto targets, a number of key challenges - namely enforcement issues, property rights and insufficient interplay between trading and technological development - will limit the effectiveness of any scheme. Some of these challenges are terminal, some solvable to a degree. All are more complex than conventional analyses would indicate.

This is more than a simple analysis of positive and negative aspects: the reality is both more complex, interlinked and ambiguous than that - and of course, contingent on the nature of other policy initiatives and their relationship to the trading regime. Chapter 2 will finish with a short conclusion of where these challenges place us in relation to the ultimate achievement of our environmental goal - emissions reduction.

2.2 Monitoring & enforcement challenges

As has been shown in Chapter 1, in a hypothetical ‘frictionless’ and perfect system, carbon trading meets the environmental objective at lowest cost. In this market place, operation would occur without the need for the regulation of trading. In the examples mentioned previously - for instance the US sulphur dioxide scheme - the relatively small scale of the schemes, the more measurable nature of the gases and the state level of operation meant that compliance and enforcement were relatively minor issues – heavily regulated but administratively manageable. The difficulty comes in the monitoring, and if necessary the enforcement of reductions of a relatively less observable gas like carbon dioxide being traded in a complex international system by legal entities whose primary aim is cost, not environmental integrity. These challenges encompass both standard carbon trading and the additional problems associated with CDM and ‘project’ reductions.

A ‘carbon-tight’ system?

Article 4 of the Kyoto Protocol specifies the construction of particular:

Modalities, rules and guidelines taking into account uncertainties, transparency in reporting and verifiability...[to ensure]...transparency, efficiency and accountability through independent auditing and verification of project activities.¹

Further, the trading guidelines under Kyoto require ‘binding targets, robust reporting and a strong national and international infrastructure to monitor, track, verify and compel

¹ - Article 4, *Kyoto Protocol* [online] [cited 31/01/2008] <<http://unfccc.int/resource/docs/convkp/kpeng.pdf>>.

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compliance to make good its promise.’² This is an implicit but sensible recognition that reductions *will* go wrong, whether through accident or design, and attempts have to be made to ensure reductions are being undertaken on target. In the event of fraud or error, the proverbial buck stops at the Enforcement Branch, an overseeing body for enforcement of the Protocol commitments.³ Carbon trading, given sufficient provision of ‘carrots and sticks’ provides minimal opportunity for negligence or worse.

Similarly, stringent mechanisms of compliance and enforcement are seemingly in operation for the CDM and JI schemes. Projects must be transparent and ‘additional’⁴, while benefits must be ‘real, measurable and long-term.’⁵ Then apparently the South - an area of initial concern because of its poor record on environmental legislation, has a vested interest in making sure emissions reductions are genuine as Sachs, Loske and Linz contend:

For the South those benefits are obvious. The countries of the South will receive considerable funds furthering development. There will be a great incentive to protect the environment as much as possible so as to continue to have surplus permits.⁶

A more problematic prediction

Unfortunately the reality of carbon trading is far more complex and its regulation more problematic, for at least two key reasons. *First*, the ability of states to backtrack on their own commitments if supervising a scheme becomes too difficult, and *second* the poor regulatory environment in the global south and the impact this has on CDM enforcement.

² Yamin, F., Depledge, J., *The International Climate Change Regime: A Guide To Rules, Institutions And Procedures*. Cambridge: Cambridge University Press, 2004, p. 156.

³ The Enforcement Branch is composed of ten members, including one representative from each of the five official UN regions - Africa, Asia, Latin America, Caribbean, Central and Eastern Europe and Western Europe and Others - as well as one from the small island developing states and two from Annex 1 and a further two from non-Annex 1 states.

⁴ See Chapter 1 for a discussion of project ‘additionality’ under Kyoto. See also: - Article 3, *Kyoto Protocol*. [online] [cited 31/1/2008] <<http://unfccc.int/resource/docs/convkp/kpeng.pdf>>.

⁵ - Article 12, *Kyoto Protocol*. [online][cited 31/1/2008] <<http://unfccc.int/resource/docs/convkp/kpeng.pdf>>.

⁶ Sachs, W., Loske, R., Linz, M., *Greening The North: A Post-Industrial Blueprint For Ecology And Equity*. London: Zed Books, 1998, p. 213.

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First, the positioning of the Kyoto Protocol, as with all international agreements, is precarious - it is held together by its members in an otherwise anarchic state system. A Party to Kyoto may, after all, leave at any time, both in principle, and, as the early departure of the United States has shown, in practice. This presents a significant factor in the construction of any scheme - effectively a 'get out' clause in the event of failure by a state to meet their commitments. Lohmann puts it bluntly:

without a world government, signatories to treaties such as the Kyoto Protocol may simply renege on their agreements if they find that meeting their targets is inconvenient.⁷

While it seems unlikely that a 'world government' would necessarily represent a solution, the sentiment is correct in that external pressures on conformity amount to little besides maintaining international prestige, a significant driver though this may be in other contexts. Essentially, carbon trading is a constructed market - with no inherent value in itself - making it susceptible to abuse and prone to poor enforcement.

Linked with this, and of equal significance is the *second* concern that the regulatory environment of the global South is too weak to effectively oversee the CDM. As Lohmann argues, 'where pollution laws are little more than paper, industry knows it need not worry much'.⁸ After all, enforcement is much more than just regular inspections - requiring a working and complex state infrastructure to support it. Lohmann continues:

Specific national circumstances, including constitutional structures, the stability of political institutions and the quality of legal infrastructures and enforcement, play a key role in determining what credible policy is.⁹

⁷ Lohmann, L., *Carbon Trading: A Critical Conversation On Climate Change, Privatisation And Power. Development Dialogue*. Uddevalla, Sweden: Mediaprint, no. 48, 2006, p. 187. See also Helm, who points out that 'an important difference from a domestic permit system is the absence of a central authority at the international level, which disposes of the power to determine the initial allocation of tradable allowances.' Helm, C., *Economic Theories Of International Environmental Cooperation*. Cheltenham: Edward Elgar, 2000, p. 94.

⁸ Lohmann, L., *ibid.*, p. 189.

⁹ Stern, N., *The Economics Of Climate Change: The Stern Review*. Cambridge: Cambridge University Press, 2007, p. 371.

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At the very least carbon trading demands ‘reliable laws, vigilant monitoring of emissions, and *consistent* enforcement’ [italics added].¹⁰ For this reason the influence of the regulatory environment of the global South means that the CDM is likely to become mired in regulatory difficulties. Pessimistically Bell suggests that many ‘countries do not have, and are unlikely to acquire, the oversight and enforcement mechanisms to make global (or domestic) emissions trading work.’¹¹ Bell however underestimates the ability of investors to assess the suitability of an investment environment. Investors are perhaps the best able to judge the security of their investment, although they are less likely to be involved in the specific compliance duties more customary to the state. They are used to assessing the overall investment climate, and are unlikely to invest in states or regions they deem inappropriate. As Mendis and Openshaw point out:

A necessary but not sufficient pre-condition for attracting investments in CDM projects is a legal environment that fosters general investment. Certainly, an environment in which rules and regulations are not in place to protect and foster investments is discouraging for CDM initiatives.¹²

The seriousness of this is difficult to overestimate. ‘People can and will flee from these institutions if they are not well designed and well managed. A badly designed example can set a good idea back for many years.’¹³ Given this, perhaps the best way forward would be one of conditionality - where states are individually and independently assessed for their ability to construct and operationalise their own regulatory systems. Initial response to this has been frosty - particularly from states in the global South, who see the potential for further incursions by the North in a regulatory capacity. This broaches issues of a broader social, economic and political nature. As economist William Nordhaus has asked:

¹⁰ Greenspan Bell, R., *The Kyoto Placebo. Issues In Science And Technology*. Winter 2006, p. 28. For the full five steps from ‘Project Design’ to ‘Issuance of CERs’, see also: Yamin, F., Depledge, J., *The International Climate Change Regime: A Guide To Rules, Institutions And Procedures*. Cambridge: Cambridge University Press, 2004, pp. 162-3.

¹¹ Greenspan Bell, R., *ibid.*, p. 28.

¹² Mendis, M., Openshaw, K., *The Clean Development Mechanism: Making It Operational. Environment, Development And Sustainability*, 2004, Vol. 6, no. 2, p. 188.

¹³ Nordhaus, W., *From Porcopolis To Carbopolis. In: Kosobud, R. (ed), Emissions Trading: Environmental Policy's New Approach*. New York: John Wiley & Sons, 2000, p. 62.

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Should states with poor scores in other areas (commercial, military, human rights, or corruption, for example) be included in an emissions-trading regime? What about countries whose governments have broken down...? Or those suffering from serious governance problems...? Will there be a set of conditions that countries will have to meet in order to be included? ...This is a very slippery slope...¹⁴

Crucially, it is also important to remember that this is a two way process, ie. mutually supporting. As Mendis and Openshaw continue: 'favourable legal and regulatory investment environments should attract CDM initiatives and *vice versa*' [italics added].¹⁵

Whose responsibility?

Another challenge, less well discussed in the literature, is the question of responsibility. This is potentially a highly significant factor determining overall compliance - in particular when things go wrong. Who has ultimate responsibility for the failure of a reduction, and more importantly, in this event will it falsely equate to an emissions reduction trade? According to Mitchell, 'by allowing such transfers, the Kyoto mechanisms raise the question of whether the 'original obligatee' or the 'proxy obligatee' is responsible if the agreed-on reductions are not achieved.'¹⁶ The former of these, the 'seller beware' option, has two key consequences - *first* emissions would increase without a corresponding trade, (negating the point of emissions trading), and *second* the value of a trade would be unaffected, providing no incentive for future compliance.¹⁷ Effectively, the trading scheme would become decoupled from the actual emissions, rendering the scheme prone to collapse. In such circumstances, a shared system of responsibility - between state, buyer, and seller is naturally desirable, although it is difficult to see how this will effectively be carried out.

¹⁴ One plausible outcome is that instead of falsified credits some areas without the required enforcement mechanisms simply do not attract investment, thereby achieving the same outcome as in the quote above. These areas would remain CDM free due to security, political or development (i.e. infrastructure) problems. Nordhaus, W., *ibid.*, p. 70.

¹⁵ Mendis, M., Openshaw, K., The Clean Development Mechanism: Making It Operational. *Environment, Development And Sustainability*, 2004, Vol. 6, no. 2, p. 188.

¹⁶ Mitchell, R., Institutional Aspects Of Implementation. In: Luterbacher, U., Sprinz, D., (eds). *International Relations And Global Climate Change*. Cambridge: The MIT Press, 2001, p. 234.

¹⁷ Grubb, M., Vrolijk, C., Brack, D., *The Kyoto Protocol: A Guide And Assessment*. London: Earthscan, 1999, p. 211.

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This has further consequences with the scaling up, and extension of trading into the global South via the CDM. Who will be ultimately responsible for failure of a reduction scheme out of two governments if after an emissions trade it transpires the reduction had not taken place? As previously discussed, in a regulatory context such as the South, it is difficult to see that in the event of the failure of a scheme (and many current projects have not meet their reductions targets) that investors in the North will continue their investment. Obviously any ‘failing’ reductions may be combined with other projects implemented at a later date, but in the relatively small timeframes of compliance periods, it may prove impossible to gain CERs quick enough to meet regulatory targets. For this reason the CDM mechanism has correctly put a blanket rule over the issuance of CERs – they may only occur post project completion.¹⁸ The importance of this *ex-ante* approval in the event of project failure cannot be overstated, as it ensures that the reduction target has already been met, and therefore provides some degree of guarantee of reductions to investors, and ultimately ensuring the Kyoto targets are secure. It also has the twin benefit of limiting the opportunity for fraud, as there is greater time for verification than pre or mid-project verification. There are however consequences to retrospective approval. The lack of any guarantee that an investment will pay off until *after* project completion provides a routine, but limiting disincentive to investment, as investors will have no way of knowing whether an investment will be worthwhile. For this reason there needs to be some attempt at pre-crediting approval for the investors’ ‘peace of mind’.¹⁹

In any case, there is another safeguard within the overall trading scheme – inherited from Kyoto itself. This is the way that only states can be signatories to Kyoto, and hence, are answerable to the Protocol. The binding targets are theirs alone, and therefore this places responsibility upon their shoulders should a scheme fail - not the legal entities who would be unable to provide the administrative system necessary for the operation of a scheme. This means that should a reduction initiative prove ineffective, the state can step in with either assistance or enforcement as necessary, with the ultimate ability to change the trading rules. As Kerr wisely points out, ‘the state is still ultimately responsible for the

¹⁸ - CDM Issuance Of CERs. [online] [cited 10/02/08]
<<http://cdm.unfccc.int/Issuance/index.html>>.

¹⁹ Grubb, M., Vrolijk, C., Brack, D., *op cit.*, p. 238.

actions of their legal entities.’²⁰ That the market can continue with its own flaws indefinitely, with no possibility of state intervention, remains a myth.

Terminal challenges

On the other hand, solutions to these general problems of enforcement remain elusive, and it is entirely possible that even given the most stringent regulatory action, emissions reductions will occur under false pretences, or not meet predicted levels. In this context, it is difficult to see, as some scholars optimistically insist, that

national self-control, international ostracism of offenders, and a watchful public should ensure success.²¹

This optimistic attitude is extended by Mendis and Openshaw who argue for clearly demarcated, robust state regulators that are separated from private sector developers and their traders.²² This assumes however that even the state, or even quasi-state bodies are independent and autonomous figures - a contention difficult to sustain when big business and government are often intertwined and mutually supporting. Bell imagines two further scenarios that may make enforcement against the state problematic:

Bringing a case is [problematic] when one party to this transaction is a state-owned enterprise that is clearly more powerful than the regulatory body that supposedly supervises it, or when the ultimate beneficiary of the sale of emissions credits is the party in power.²³

Striking the perfect balance between on the one hand ensuring legal entities and states are ‘playing by the rules’ and on the other allowing the market to do its job is consequently very difficult. Ultimately, the need for compromise between the imperatives of efficiency, limiting cost and not stifling the actual trading process itself is an impossible task. There will always be the need for a trade off between priorities within an ETS,

²⁰ Kerr, S. (ed), *Global Emissions Trading: Key Issues For Industrialised Countries*. Edward Elgar Publishing: Cheltenham, UK, 2000, p. 13.

²¹ Sachs, W., Loske, R., Linz, M., *Greening The North: A Post-Industrial Blueprint For Ecology And Equity*. London: Zed Books, 1998, p. 213.

²² Mendis, M., *op cit.*, p. 183.

²³ Greenspan Bell, R., *op cit.*, p. 30.

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because it is essentially about ensuring as little disruption as possible to the economy, and not primarily about the achievement of the environmental goal.²⁴ Hence one assessment of carbon trading regulations puts it that ‘[e]xperience from both the UK and EU emissions trading schemes has also shown that there is a trade-off between keeping the rules simple, effective and fair.’²⁵ These trade-offs indicate the underlying tension running throughout carbon trading - that of doing what is feasible versus achieving the environmental goal. This is embodied in the spirit of all market mechanisms - simplicity to ensure ‘administrative and private sector feasibility’²⁶, an unfortunate position given the potential that this may require a loss of environmental integrity, as shown in Chapter 3.

Consequences of failure

It is the magnitude and significance of failure that brings the importance of enforcement out of the normal remit of environmental regulation. The true meaning of fraudulent claims of emissions reductions is not an obviously comparable case to enforcement within other fields, because of both the consequences of climate change and the scope for vastly underachieving in global reductions of emissions. This latter is worth stressing - the sheer scale of potential ‘pretend’ or ‘false’ emissions reductions means that proper regulation of a trading scheme is essential. While many other environmentally-orientated regulations are important, none have such a global reach, and hence capacity for error. This uniqueness of carbon trading is further compounded by those who organise legislation and enforcement being differently located to those who receive the worst impacts of climate change - both over time and space. This acts as a disincentive to stringent reduction and enforcement policies. The special case of carbon trading is discussed by Bell:

²⁴ More correctly, as will be seen, what can be achieved by carbon trading partly determines how ambitious the environmental goal is to start off with.

²⁵ Enviros Consulting Ltd., *Appraisal Of Years 1-4 Of The UK Emissions Trading Scheme*. London, Dec 2006. [online] [cited 29/02/2007]

<<http://www.defra.gov.uk/environment/climatechange/trading/uk/pdf/ukets1-4yr-appraisal.pdf>>. p. 2.

²⁶ Kerr, S. (ed), *op cit.*, p. 2.

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If trading GHGs were a routine commercial transaction, the normal solution would be to punish the wrongdoer or compensate the loser. This is not a normal transaction. Unchecked releases of GHGs impose their injury on the public, but the public is rarely party to the deal, except through the watchful eyes of government regulators.²⁷

That said, this argument assumes that carbon trading is an effective mechanism - that it will work given sufficient compliance, and all that is necessary is proper recognition of this through careful regulation. Such faith is only partially justified - as Chapter 3 will show. The Kyoto targets were only ever minimal, and as such the trading scheme will only ever be a partial solution. As was shown in the Conclusion to Chapter 1, it only represents a minimal, and insufficient attempt at solving climate change. In such a context it is perhaps irrelevant whether it proves regulatory problematic or not.

Just as we saw carbon trading emerging as a market solution to a market problem, a market solution will equally *create* market problems of its own accord. These market originated problems demonstrate the inherent driver that ensures boundless opportunity for corruption, poor verification, compliance and enforcement – namely *cost*, or more precisely the obsession with minimising cost.²⁸ As we shall see in Chapter 3, this tension within carbon trading is terminal. As Kerr notes about such a market mechanism, there is a

fundamental unease with the idea that countries can meet environmental commitments with money rather than through direct domestic action.²⁹

2.3) Reflections on the dangers of property rights & privatization

Stemming from the equity concerns outlined in Chapter 1, this section will explore the potential negative consequences of giving out rights to emit, both on a moral and

²⁷ Greenspan Bell, R., *op cit.*, p. 30.

²⁸ Tietenberg, T., *Environmental Economics And Policy* (5th Edn). London: Pearson, 2007, p. 324.

²⁹ Kerr, S. (ed), *op cit.*, p. 2.

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practical level. Is this ownership of the ‘right to emit’ problematic?³⁰ For, traditional theory would suggest, by encouraging ownership, the ‘tragedy of the commons’ syndrome that has previously been discussed can best be avoided. But giving carbon a price may prove to be a Janus face - on the one hand encouraging reductions but on the other ceding control to unscrupulous legal entities whose sense of responsibility may be weak. Does this represent a philosophical conundrum or is it merely a challenge of semantics?³¹

The Kyoto Protocol ‘has not created or bestowed any right, title or entitlement to emissions of any kind on Parties included in Annex 1.’³² So reads the official claim of the UN FCCC. Unfortunately, this is not the case - carbon trading is synonymous with emissions rights, and there are very good reasons, explained below, why the UN FCCC would want to avoid giving this impression. Indeed, as the Stern Review explains, the ‘basis of emissions trading is assigning property rights to emitters, and then allowing these to be traded’.³³ One text book makes the issue clear; carbon trading ‘requires clearly defined property rights.’³⁴ Ultimately all schemes have ‘legal instruments’, which almost by definition must ‘provide evidence of ownership.’³⁵ The question is therefore not whether carbon trading amounts to emissions rights, but whether there are consequences to such rights, either positive or negative? How far does this represent a shift in power relations, and how far is this shift a negative thing? Torres puts the problem baldly: ‘an emitter is not only legally obligated to reduce emissions down to the

³⁰ This ‘right’ to emit is conferred through the assignment of a cost to each unit of carbon, which can be purchased and hence owned.

³¹ This concern is not to be confused with the *method* of distribution – whether that be ‘grandfathering’ or auction. The former of these is where credits are given out with no cost implication, and some concerns have been raised as to whether this may amount to signalling an approval of carbon emissions. In reality, it makes little difference whether they are given out or sold. Ultimately the permit constitutes a ‘right’.

³² - UN FCCC, *Principles, Nature And Scope Of The Mechanisms Pursuant To Articles 6, 12 And 17 Of The Kyoto Protocol, Decision 15/CP.7* [online] [cited 11/12/07] <<http://unfccc.int/documentation/decisions>>.

³³ Stern, N., *The Economics Of Climate Change: The Stern Review*. Cambridge: Cambridge University Press, 2007.

³⁴ Kerr, S. (ed), *op cit.*, p. 24.

³⁵ Sandor, R. et al, ‘An Overview Of A Free-Market Approach To Climate Change And Conservation.’ In: Swingland, I. (ed), *Capturing Carbon And Conserving Biodiversity: The Market Approach*. Earthscan: London, 2002, p. 56.

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limit specified on its permit; it is also legally entitled to emit up to that amount.’³⁶ Is this a problem?

The moral & practical implications of property rights

This poses a moral as well as practical challenge. First, the moral dimension to giving legal entities the right to emit is problematic terrain. Rights amount to a legitimization of the process of pollution - a kind of permission, which, in the context of climate change equates to a moral ‘thumbs up’ from the state to continue doing what is essentially a ‘bad thing’. The most articulate description of this comes from Tietenberg:

treating pollution as a commodity that can be bought and sold not only removes the moral stigma that is appropriately associated with it, but also trading reductions undermine the important sense of shared responsibility required by global cooperation...legitimising further domestic emission by offsetting it with a credit acquired from a project in a poorer nation would be very different from penalising the firm for emitting, even if the cost of the credit were equal to the penalty.³⁷

Most mainstream considerations of this problem are uncritical. They assume that this is a necessary consequence of avoiding the ‘tragedy of the commons’ - arguing instead that any alternative would be far worse without ownership. In certain instances, particularly where the owner has some vested interest in achieving an environmental goal, this is the case. Unfortunately these discussions rarely, if ever take into account the precedents that are being set, nor the unique complexity of emissions trading, for a substance as prone to the influence of manipulation as carbon. In short, rights to emit carbon act as the foundation stone for a future discourse of power around climate change that will become determined by legal entities - largely big business. This is a worrying trend. After all:

Rights give access; rights give power. Property is not a relation between an individual and a thing, but, crudely speaking, between people and people. The law may or may not be involved, but realising property rights depends on a whole raft of social factors that include trust, access to

³⁶ Torres, G., Who Owns The Sky? *Pace Environmental Law Review*. no. 19. 2001, pp. 515-74.

³⁷ Tietenberg, T., *op cit.*, p. 325.

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authority and knowledge, and perhaps also access to markets, capital, measurement technology, records, accounts, labour and identity.³⁸

Counter arguments point out that we risk questioning the notion of having limits themselves. Surely, so the argument runs, even the Protocol would be guilty of sanctioning a certain level of emissions - in fact 92-100 per cent of 1990 emissions?³⁹ However, while applying this on a moral level makes sense, looking to the future it is perhaps less applicable. Whereas in Kyoto itself it is a diffuse ownership of the problem (embedded in the state), in carbon trading specific legal entities are given power, with no democratic balance, no accountability, and less limitations. In short, they lack the authority, and also the relatively responsible attitude of the state.

The consequences are potentially somewhat aggravated in the context of the CDM, where Northern based businesses will have significant power through investment. Combined with the problems of regulation in the South more generally (discussed above) there is a potential opportunity for the abuse of power. By making legal entities the key players within an emissions reduction scheme, they will both control the entry of money into the South, and crucially have a potentially significant influence over both the source and outcome of environmental consultation.⁴⁰ This potentially holds a bias issue, as well as opening up a whole new discourse of power linked to the emissions of carbon – rooted in the North's new carbon ownership. In this way, the concept of giving business the right to emit ignores the actions of those who may be reducing emissions outside of the corporate sphere. For instance, campaign NGO Durban Group for Climate Justice accuse the trading scheme of promoting the work of highly polluting big business while ignoring the efforts of small scale community based projects.⁴¹ Whether by accident or design, carbon trading

³⁸ Lohmann, L., *op cit.*, p. 78.

³⁹ Grubb, M., Vrolijk, C., Brack, D., *The Kyoto Protocol: A Guide And Assessment*. London: Earthscan, 1999, p. 96.

⁴⁰ Sachs, W., Loske, R., Linz, M., *op cit.*, p. 214.

⁴¹ - *Carbon Trade Watch*. [online] [cited 31/01/2008] <<http://www.carbontradewatch.org>>.

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appeals to a 'market fix' that secures the property rights of heavy Northern fossil fuel users over the world's carbon absorbing capacity while creating new opportunities for corporate profit through trade.⁴²

In essence then, carbon emissions trading has the potential to place legal entities - big business - the emitters of yesteryear, as the future custodians of the global environment. As Lohmann observes:

rights to the earth's carbon-cycling capacity are gravitating into the hands of those who have the most power to appropriate them and the most financial interest in doing so.⁴³

Is this necessarily a wise choice? Given the scale of carbon emissions that are likely to be traded, this is a worrying trend. For instance, the EU ETS - comprising a total of 11, 428 industrial installations in 2005, all of which have been given emission rights, has monopoly over half of EU emissions. Where does this place other actors - such as states, or civil society in other attempts at emissions reduction? These actors nor their emissions reductions are recognised by the scheme, while legal entities now have the 'right' to emit - an asset which they are unlikely to relinquish willingly in the future. While the state may still be ultimately responsible, big business now owns, and hence controls, carbon.

2.4) Revisiting the 'R&D' driver hypothesis

This section will deal with the assumption - presented in Chapter 1 - that carbon trading will induce technological R&D by legal entities because of the cost incentive.⁴⁴ Article 4 of the Kyoto Protocol demands that all Parties

promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases.⁴⁵

⁴² Lohmann, L., *op cit.*, p. 50.

⁴³ Lohmann, L., *ibid.*, p. 73.

⁴⁴ This section will steer clear of discussions of whether we feasibly *can* technologise our way out – itself requiring a separate chapter.

⁴⁵ - *The Kyoto Protocol Article 4*. [available online] [cited 20/01/08]
<<http://unfccc.int/resource/docs/convkp/kpeng.pdf>>.

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These so called ‘environmentally sound technologies’ (ESTs) have been heralded as one of the dynamic gains of emissions trading, as legal entities become pressurized within the cost benefit curve to invest in alternative technologies. These technologies then lower emissions both for the legal entity and industry and society as a whole.

Trading can provide a strong incentive for R&D, investment in plant and equipment and adoption of new technology...Economic theory suggests that economic instruments are superior to other forms of regulation in encouraging the private sector to carry out R&D and disseminate and use the results.⁴⁶

As the above quote would suggest, market mechanisms appear to do this more efficiently than other methods. More specifically, as Downing and White continue, emissions trading generally provides more incentives for technological innovation than ‘command and control’ policies (such as performance standards and technology mandates).⁴⁷ If this is true, emissions trading should encourage a large scale, systemic switch to ‘clean’ technologies over the medium to long-term.

While this seems intuitively correct, unfortunately there is less evidence for the link in reality.⁴⁸ Establishing a causal link between relatively minor pressures for reduction and an increase in R&D is, at best, optimistic, and at worst a potential trap. To start with, there is a lack of adequate measurement tools with which to establish a significant data set to establish causation. Griliches makes this challenge clear:

⁴⁶ Kerr, S. (ed), *op cit.*, p. 14.

⁴⁷ Downing, P., White, L., Innovation In Pollution Control. *Journal Of Environmental Economics And Management*. 13. 1986, pp. 18-29. This is disputed – Malueg for instance argues that while trading undoubtedly provides incentives for reductions and some innovation, but compared to other types of regulation it is relatively inefficient at pressurizing change. Malueg, D., Emissions Credit Trading And The Incentive To Adopt New Pollution Abatement Technology. *Journal Of Environmental Economics And Management*. 16. 1987, p. 52.

⁴⁸ See for instance: Bohm, P., Russell, C., Comparative Analysis Of Alternative Policy Instruments. In: Kneese, A., Sweeney, J. (eds), *Handbook Of Natural Resource And Energy Economics*. Amsterdam: North-Holland, 1985.

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The main difficulty lies in the unavailability of direct and relevant measures of the output of the R&D process and the resulting necessity of using indirect measures such as aggregate productivity growth, measures which may reflect the contribution of R&D investment imperfectly, if at all.⁴⁹

In this confusing context, policymakers have to and must make decisions. The Australian Government for instance stipulates that an emissions trading 'scheme must provide the right incentives to drive investment in low emission technologies and renewable energy'.⁵⁰ This hides a more ambiguous relationship between cost and R&D. In essence, there are two quite separate methods for approaching abatement, both important. The *first* is the surface changes that are easily reversible - making minor adjustments to processes that remain fundamentally unchanged, such as turning off appliances. The *second* is the most desirable in the long-term - the R&D of new technologies, the restructuring of production systems to increase efficiency, and a significant change in lifestyles. This second option will have knock-on effects well into the future - as there are positive implications beyond the immediate reductions both for a) R&D and b) within the sector as a whole. As Lohmann makes clear: 'How cuts are made now will have an influence on how much can be cut in the future.'⁵¹

The concern is that carbon trading, with only a minimal reduction target of five per cent, will be insufficient in pressurizing significant levels of R&D. Under trading, because there is only a minimal incentive to reduce emissions, only the cheapest and least intensive adjustments will be made. Undoubtedly in the short-term this will meet the reduction target, but it is unlikely to spill over into systemic change to an economy based on carbon alternatives. As Stern makes clear, this obsession with cost in the short-term may be counter productive - increasing the cost in the long-term and, ironically, simply delaying technological development that will occur by necessity.⁵² This is compounded by the fact that legal entities do not know what the reduction level is going to be post-

⁴⁹ Griliches, Z., R & D and Productivity: Econometric Results And Measurement Issues. In: Stoneman, E. (ed), *Handbook Of The Economics Of Innovation And Technological Change*. Oxford: Blackwell, 1995, p. 53.

⁵⁰ - 'Emissions Trading'. Department of Climate Change. [online] [cited 26/01/08] <<http://www.greenhouse.gov.au/emissionstrading/index.html>>.

⁵¹ Lohmann, L., *op cit.*, p. 103.

⁵² Stern, N., *op cit.*, 2007.

2012. This makes a mockery of any attempt to plan ahead in the R&D context - as investment is unlikely to be made for an uncertain abatement future. This again favours short-term investment, and also encourages free-riding not only because R&D costs money relative to imitating technologies, but also because states will want to reduce their assigned emissions reductions targets relative to competitors. This works because by *not* investing now, they increase their potential costs for the second commitment period, and are thereby able to lobby for lower targets. This helps to explain why technological development has been slower than anticipated.

Another dimension to this problem is the phenomenon of technological ‘lock-in’. In this case, there is lock-in of energy intensive, carbon emitting technology, that is ingrained as well as constituting modern society, both in the global North and increasingly in the global South.⁵³ Certain technologies

gain a head start on other technologies and become entrenched in far-reaching technological, political and cultural webs. These webs give them the advantage of economies of scale, synergies with other industries, access to policymakers, accumulated specialist expertise, and subsidies of various kinds.⁵⁴

Unfortunately, the inertia of such a system as this can make replacement of existing technologies very difficult indeed. This favours the continued use of carbon technologies and encourages the superficial change envisaged above.

In addition to these issues, the CDM also discourages R&D, because ‘flexibility’ provides a method of avoiding new technological development. While indirectly providing a vector for the transmission of technology into the South, it depressurizes the need for R&D in the North. Further, this outsourcing of emissions reductions is unlikely

⁵³ Separately, locked-in technologies have differential distribution between the North and South. The North tends to import products that have had a relatively carbon intensive production in the global South. Under conventional measures of emissions that have been used (i.e upstream emissions that only register in the country of production) this would not be accounted for. Emissions trading is blind to this phenomenon, the emissions of which are problematic to calculate but highly significant. This outsourcing of carbon emissions remains a worry in the CDM. See Druckman, A., et al., *Measuring Progress Towards Carbon Reduction In The UK. Ecological Economics.* (2007), pp. 1-11.

⁵⁴ Lohmann, L., *op cit.*, p. 110.

to encourage technology transfer to developing countries (previous attempts at formally encouraging transfer have all failed) - largely because it makes poor economic sense from an investors perspective, and there is inadequate treatment of the topic in the Protocol.⁵⁵

In summary, it is highly unlikely that the relatively minor targets imposed by the Protocol will cause significant technological change within legal entities. Investment in alternatives is discouraged because of the minimal returns that legal entities will see in the short-term time period of trading, and the lock-in of carbon based technologies across industry. This will encourage a slow transition to a low carbon economy, even with drastic new targets, as cost efficient (but environmentally inefficient) cuts will always be made first. This is in direct contrast to the fact the more expensive technological solutions, are ultimately likely to be the best for reducing emissions. This theme - carbon trading not creating systemic change - will be explored further in Chapter 3.

2.5) Conclusion

Most critiques of carbon trading focus, unfairly, on the technical teething problems of any market mechanism - for instance the over application of permits in the EU ETS in 2006. Fortunately, as an artificial construction, the market place can easily be adjusted to take these aberrations into account. Not inappropriately, most academic discourse has concentrated on these phenomena in an attempt to ensure an efficient design and regulatory system. Such work is ongoing - following Kyoto it was agreed that 'implementation of the Kyoto Protocol will depend heavily on the evolution of emissions trading, joint implementation programs and the Clean Development Mechanism.'⁵⁶ This chapter has attempted to look beyond these issues to understand the wider implications of trading - the problems that are unlikely to be solved by market mechanisms alone, and are indeed often a product of the market mechanism itself.

⁵⁵ Grubb, M., Vrolijk, C., Brack, D., *op cit.*, pp. 104-6.

⁵⁶ Raustiala, K., *Nonstate Actors In The Global Climate Regime*. In: Luterbacher, U., Sprinz, D., (eds). *International Relations And Global Climate Change*. Cambridge: The MIT Press, 2001, p. 109.

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The issues of enforcement - both intra and more significantly, interstate - particularly in the global South, are likely to be terminal problems that plague the growing internationalization of the trading scheme to its full capacity. Likewise, the privatization of carbon emissions through property rights could potentially stifle future reductions, turning Hardin's 'tragedy of the commons' into a 'tragedy of the corporations', where emissions reduction becomes increasingly determined by business and not political institutions. Combined with the minimal evidence that such a small drop in emissions will drive technological development, these points suggest a worrying trend towards the ultimate failure of carbon trading to provide a truly global reduction in emissions in the medium to long-term. Supposedly sound economics, as will be further explored in Chapter 3, is increasingly looking more like a false economy, the product of policy makers concern for maintaining growth and the status quo as opposed to environmental integrity. Of course there are multiple pressures in operation that determine the choice of carbon trading - and in some ways make it inevitable - but, as will be shown, it will act as little more than a first step towards a low carbon economy as opposed to a solution in itself.

The liberal, Western obsession with both cost and growth has framed the debate in an unhelpful way, narrowing the discourse into an approach from a specific, if widespread and hegemonic doctrine of the market. One consequence of this has been the minimal treatment of wider questions surrounding carbon trading and the focus on policy orientated analysis. It has ignored the fact that most fossil fuels must remain in the ground, and, in the rush to achieve the short-term aims of Kyoto, has underestimated emissions trading's own limitations in achieving a low carbon world economy. As will be shown in Chapter 3, these errors are likely to foreshadow the trajectory of the Earths climate long into the future, and provide somewhat ambiguous benefit over the long-term. The question again needs to be asked; where is carbon trading taking us and will it make a significant, sustainable difference in the absence of structural change?

CHAPTER 3: CONCLUSION

Does carbon trading nonetheless represent useful progress? Short & long-term factors

Where it is shown that carbon trading will provide a crucial first step for deeper emissions reductions in the future

3.1) Putting the limitations of carbon trading into context

In his ground breaking article on sustainable development, Meadows argues that contrary to popular belief, sustainable development is not only conceptually flawed, but a fundamentally dangerous idea. He argues that by suggesting indefinite development at current levels could be sustainable, the fallacy is maintained that continued growth is possible.¹ According to him, this puts us in a worse position than if there had been no sustainable development whatsoever. Chapter 2 similarly suggests that carbon trading, as another inhabitant of the sustainable development universe, potentially puts us in a comparable position, allowing the continued belief that ‘something is being done’ while in reality the configuration of the global economy will dictate continued emissions increases long into the future. We continue headlong towards climate chaos while assuming trading is taking care of our woes.

¹ Meadows, D., It Is Too Late To Achieve Sustainable Development: Now Let Us Strive For Survivable Development. In: Krull, W. (ed), *Debates On Issues Of Our Common Future*. Göttingen: Velbrück Wissenschaft, 2000, pp. 107-27.

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In this context, the question emerges ‘does carbon trading nonetheless represent useful (if insufficient) progress?’ Even if, as has been shown, carbon trading on its own will be insufficient to avert catastrophic climate change, this chapter will predict that it will have generalised but useful spin-off consequences that are likely to be beneficial beyond immediate emissions reductions. The treatment of these spin-offs will be divided in two – *first* the achievements of carbon trading of itself, concentrating on the way it gives carbon a price (direct consequences). *Second*, and equally significantly, it will be shown that trading acts as a platform and ‘normative discourse of transition’ that will be crucial in encouraging deeper emissions cuts in the future (indirect consequences). These twin topics - what carbon trading achieves for us now, and what it *will* achieve for us, are synonymous with short and long-term consequences respectively, and they are discussed in these terms here. This chapter will then conclude that carbon trading represents a significant first step in the highly problematic switch to a low carbon economy. In this way it will put the limitations of carbon trading discussed in Chapter 2 into context and attempt to isolate the exact worth of carbon trading in combating climate change.

3.2) Short-term effectiveness of carbon trading in addressing climate change

Short-term, carbon trading will have no significant impact on the rate or degree of climatic change. By its very design, the Kyoto Protocol in which it sits is a short-term ‘point of departure’ for later and more serious efforts to control emissions, and so carbon trading will, as it currently stands, never offer a ‘solution’ in the sense of stabilising emissions or creating a low carbon economy through its own mechanisms. A demonstration of this modest ambition in the short-term is the relatively small five per cent reduction commitment, as compared with for instance more significant domestic targets such as the UK’s ‘sixty per cent cut by 2050’ target for carbon emissions.² However this is not the objective of emissions trading. This is perhaps a drawback of the Kyoto Protocol more broadly as much as of carbon trading:

² The UK’s Climate Change Bill will become the first legally binding, quantified domestic targets in the world. Druckman, A., et al., Measuring Progress Towards Carbon Reduction In The UK. *Ecological Economics*. 2007, p. 1.

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The Kyoto Protocol is not a comprehensive program to reduce the threat of global warming. It is the beginning of a process and the development of a comprehensive system must begin immediately in order to achieve this relatively modest goal.³

Given the combination of this ‘modest goal’ and the problems associated with trading, the EU ETS (the only currently operational scheme) is unlikely to meet even this commitment.⁴ More significant still, over the short-term trading also makes no provision for the reduction of the remaining ninety-five per cent of emissions, nor for emissions taking place outside of the trading scheme. The point needs to be emphasised again: by itself, carbon trading is insufficient to achieve emissions reductions capable of averting catastrophic climate change.

The cost imperative

The ineffectiveness of carbon trading over the short-term in addressing climate change is bound up with the economic priority of cost, a discourse outlined in Chapter 1. In summary, this stated that due to a number of factors, not least of which was the uncertainty of how significant a threat climate change posed, which meant any reductions had to take place at minimal cost against the possibility that it transpired to be a ‘damp squib’. By consequence, given the concern of potential cost implications, Kyoto signatories took the rational step of minimising the commitment while also laying a framework for future reductions if climate change transpired to be *more* significant than anticipated. The construction of these parameters - through a compromise between cost and the environment - has led to carbon trading developing as the most efficient mechanism.

Unfortunately, as has been shown elsewhere, short-term cost should not be prioritised at the expense of the environmental goal.⁵ With the benefit of hindsight, it is possible to see

³ Kahn, J., Franceschi, D., Beyond Kyoto: A Tax-Based System For The Global Reduction Of Greenhouse Gas Emissions. *Ecological Economics*. 2006, no. 58, pp. 778-87.

⁴ For more on the lessons learnt from the EU ETS, see Chapter 1, p. 14.

⁵ As Kerr points out, it is not as simple as cost-benefit analysis as there are other, non cost factors to take into account. With environmental goals, the complexity of isolating these other factors – including the behaviour of natural systems and their interrelationship with human ones means that the level of acceptable

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that there needs to be far greater ‘reconciliation of the economy (efficiency) and the environment (effectiveness)’ if carbon trading is to work, because favouring the former at the expense of the latter may ironically end up costing more.⁶ This is because what appears to be low cost in the short-term may in fact end up costing more when environmental pressures cause increasing damage and processes become irreversible. The latter of these concerns has an important equity dimension, as there is an inherent responsibility within the sustainable development paradigm (of which carbon trading is a product) for intergenerational justice.⁷ As the OECD point out, ‘what may be least cost today may be unfair to future generations.’⁸

Clearly carbon trading has failed to address these crucial cost concerns over the short-term, but this hides the true worth of carbon trading. As described in Chapter 1, by giving carbon a price, it avoids the ‘tragedy of the commons’, in which legal entities must internalise the environmental cost of emitting carbon. Such a conceptual change of approach is very significant in the wider sense of providing a strong linkage between the process of emissions and politics, but is of limited use if the internalised cost does not equate to the true environmental cost, as is the case with carbon trading and climate change. Therefore, carbon trading can only ever provide a partial solution, and must be coupled with other mechanisms that can provide unilateral incentives for technological R&D and adoption, as well as more general normative change. As Stern explains, ‘carbon

risk has to be lower than for a more conventional economic decision. Kerr, S. (ed), *Global Emissions Trading: Key Issues For Industrialised Countries*. Edward Elgar Publishing: Cheltenham, UK, 2000, p. 12.

⁶ Woerdman, E., Boom, J., Nentjes, A., Economy Versus Environment? Design Alternatives For Emissions Trading From A Lock-In Perspective. In: Kok, M., Vermeulen, W., Faaij, A., de Jager, D. (eds), *Global Warming And Social Innovation: The Challenge Of A Climate-Neutral Society*. London: Earthscan, 2002, p. 160. More recently, see also: Stern, N., *The Economics Of Climate Change: The Stern Review*. Cambridge: Cambridge University Press, 2007.

⁷ This concluding chapter will not concern itself with the ways in which carbon trading fits into the broader field of sustainable development – a field that needs vast expansion particularly in relation to the CDM. Suffice to say that sustainable development is intrinsically measured over the long-term i.e. that it meets ‘the needs of the present while not compromising the ability of future generations to meet their own needs’. See *Agenda 21: Earth Summit – The United Nations Programme For Action From Rio*. [online] [cited 24/02/2008] <<http://www.un.org/esa/sustdev/documents/agenda21>>.

⁸ - Climate Change: Evaluating The Socio-Economic Factors. *Organisation For Economic Co-operation And Development*. Paris: OECD, 1991, p. 19.

pricing policy should sit alongside technology policies, and policies to remove the behavioural barriers to action.’⁹

Carbon pricing is only one part of a strategy to tackle climate change. It must be complemented by measures to support the development of technologies, and to remove the barriers to behavioural change, particularly around take-up of energy efficiency.¹⁰

3.3) Long-term effectiveness of carbon trading in addressing climate change

As has been shown above, carbon trading will not make a difference to climate change over the short-term, mainly because its capacity to reduce emissions is insignificant and ‘spin offs’ such as technological development will not occur over the short-term. The long-term effectiveness of carbon trading is no less ambiguous, although this section does conclude that it represents a useful start given the political unacceptability of other options.¹¹

The first problem with carbon trading is also true of the Kyoto Protocol more broadly: it is short-termist for a challenge that is intrinsically long-term. While carbon trading is an appropriate policy response to meet the limited internal objective of Kyoto (the five per cent reduction), a more significant question is whether such a mechanism helps us in the transition to a low carbon economy - a fundamentally separate issue that is being inadequately dealt with in the trading literature. The problem lies with the legislative framework within which carbon trading is situated, not with the mechanism itself.

The Protocol does not provide any guidance or formulae linking the action required in the first commitment period to an overall global quantity constraint or to long-term timetable for emissions reductions.¹²

⁹ Stern, N., *ibid.*, p. 365.

¹⁰ Stern, N., *ibid.*, p. 368.

¹¹ See for instance: Grubb, M., Vrolijk, C., Brack, D., *The Kyoto Protocol: A Guide And Assessment*. London: Earthscan, 1999, p. 219.

¹² Stern, N., *op cit.*, p. 365.

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It lays out no framework for long-term reductions post 2012, and as will be explored later, makes only marginal incentives for sustainable development through the CDM and Annex B trading. As Stavins notes, Kyoto is ‘too little, too fast’ in meeting ‘the overall challenges’ and will require further steps to stabilise emissions.¹³ In this way, carbon trading is not directly linked to long-term, structural change, a criticism also true of environmental regimes more broadly.¹⁴

Growth of carbon emissions in the South

Particularly worrying is that carbon trading also ignores the very serious concerns associated with the ‘rise of the South’. Annex II countries have no limits placed upon them under Kyoto, a matter of considerable concern as countries including India, China, and Mexico make economic advances that dramatically increase their emissions to developed world levels. Even given the CDM, which may aid the transfer of low emissions technology, it is highly likely that development will tend to favour low cost, high carbon technologies over ‘green’ ones, which combined with high populations is likely to lead to a significant growth in carbon emissions over the medium to long-term. Kahn and Franceschi illustrate with the examples of China, India, Brazil and Mexico:

If these four countries embarked on a development path that resulted in the same per capita emissions as the United States, the emissions from these four countries would exceed the emissions generated by the entire world in 2000. The implications of this statistic are incredible. Even if these countries only increased their emissions to half the US per capita level, the rest of the world, including the rest of the developing countries would have to cut their emissions by 50% just for the global emissions to remain constant, which would still generate increases in atmospheric concentrations of carbon dioxide.¹⁵

¹³ Stavins, R., Can An Effective Global Climate Treaty Be Based On Sound Science, Rational Economics And Pragmatic Politics? *Discussion Paper, Resources For The Future*. [online] [cited 17/2/2008] <<http://www.rff.org/Documents/RFF-DP-04-28.pdf>>.

¹⁴ As Little points out, environmental regimes are almost always ineffective in achieving their stated aims. Little, R., International Regimes. In: Baylis, J., Smith, S., *The Globalization Of World Politics: An Introduction To International Relations (3rd Ed)*. Oxford: Oxford University Press, 2005, p. 375.

¹⁵ Kahn, J., Franceschi, D., *op cit.*, p. 779.

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Given this, absolute emissions caps must be extended to Annex II states (beyond the weak emissions reduction language of the Protocol).¹⁶ Starkly framing this issue are the equity concerns discussed in Chapter 1. Annex I states have a 'right' to develop that will always be in tension with, (and possibly forever irreconcilable with) the necessity for emissions reductions. The discourse surrounding the climate change/development interface needs to be very rapidly expanded if equitable solutions are to be found.¹⁷

Evolution of carbon trading into a low carbon economy

If carbon trading will have no significant impact on emissions as a stand alone policy, and if the configuration of Kyoto means the South will continue to increase its emissions, what other impacts will trading have in addressing climate change? This section will deal with how carbon trading fits into the broader transition from the present levels of emissions to a low carbon world economy.

The first dimension to this is the nature of the precedent being set. As Duwe of Climate Action Network points out, the first half of the EU ETS has helped to establish the principle of absolute caps in emissions, provided incentives for legal entities to reduce emissions, internalised the cost of carbon emissions, and acted as an important role model for the rest of the world.¹⁸ This is a highly significant set of developments beyond the obvious reduction in emissions. Looking to the continuation and expansion of Kyoto, Helm supports this:

The success or failure of emissions trading can have far-reaching implications beyond climate change politics in that it may become a model for other areas of international cooperation as well.¹⁹

¹⁶ Depledge, J., Continuing Kyoto: Extending Absolute Emission Caps To Developing Countries. In: Baumert, K., et al., *Building On The Kyoto Protocol: Options For Protecting The Climate*. US: World Resources Institute, 2002, pp. 31-60.

¹⁷ For the most recent and comprehensive overview of this field, see: Munasinghe, M., Swart, R., *Primer On Climate Change And Sustainable Development: Facts, Policy Analysis And Applications*. Cambridge: Cambridge University Press, 2005.

¹⁸ Duwe, M., Improving The EU ETS For The Climate: NGO Perspective On The State Of The EU ETS. *INFORSE – EREF – EUFORES Seminar*. March 2007, Climate Action Network Europe. [online] [cited 17/02/2008] <http://www.inforse.dk/europe/pdfs/SB07_ETSMDuwe.pdf>.

¹⁹ Helm, C., *Economic Theories Of International Environmental Cooperation*. Cheltenham: Edward Elgar, 2000, p. 94.

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Kerr goes further, arguing that emissions trading has more than just its direct worth alone, but puts us in a better position later to ‘respond quickly to future environmental threats’.²⁰ It opens up a whole discourse of serious environmental policymaking previously ignored, while simultaneously providing the implementation framework to make a difference on the ground. This combination is highly significant, considering the possibility of natural processes acting synergistically and hence with greater complexity in the future. For instance there is at present very little policy linkage between climate change and deforestation - two processes that are getting more acute without any coherent policy addressing them. The discursive, normative dimension of better environmental policymaking must not be underestimated, and perhaps represents the key outcome from carbon trading. As Weaver speculates:

A commitment to undertake a fundamental revision of the industrial economic system is establishing [itself], and the industrialised world stands poised to undergo an environmentally motivated ‘eco’ transition. This will be both policy and market driven.²¹

While perhaps such confidence in a transition as fundamental as he is envisaging is premature,²² the sentiment is correct in that carbon trading has paved the way for the envisaging of more radical cuts in emissions. Carbon trading does therefore represent a solution of sorts - a necessary but not sufficient condition for later more significant action on global emissions. As Bell argues:

Trading and technology will play a role in taming climate change, but they are only a piece of the solution, not the entire answer. A strong dose of realism is past due. Even granting that cap and trade can be a model, attention must shift to the cap and how to make it work.²³

²⁰ Kerr, S. (ed), *op cit.*, p. 8.

²¹ Weaver, P., *Steering The Eco-Transition: A Material Accounts Approach*. In: Taylor, M. (ed), *Environmental Change: Industry, Power And Policy*. Aldershot, England: Ashgate Publishing, 1995, p. 83.

²² Weaver is after all conceiving of a whole gamut of changes well beyond the scope of carbon trading: ‘Eco-transition represents a potentially major economic upheaval involving fundamental systemic changes in response to changing societal values and concerns. It presents both threats and opportunities for business, policy makers and society. It raises concerns about employment impacts, profitability, competitiveness, and trade; about financing development and risk taking; about the direction of technological progress; and about environmental policy impacts on all of these as well as on the environment.’ Weaver, P., *ibid.*, p. 83.

²³ Greenspan Bell, R., *The Kyoto Placebo. Issues In Science And Technology*. Winter 2006, p. 31.

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Such change must and will happen. As Jacoby et al point out, in a comparison to the evolution of the General Agreement on Tariffs and Trade, which

grew and evolved over time, adding countries and goods along the way, peacefully resolving conflicts between national economic interest, and contributing importantly to global economic growth...*but it took 50 years of hard work – even given an intelligent, forward looking design at the outset.*[Italics added]²⁴

This evolution of the scheme is already underway. The management of the scheme allows for variation and development:

The debates over what to include and exclude on the COP agenda demonstrate that procedural and institutional issues are also laced with values and political choices...[there are] a number of areas where new thinking is required and for which it may be wise to construct new policy spaces where those interested in the climate change regime can meet and talk honestly about what the world might look like if we venture beyond the current framework.²⁵

This forms the groundwork for, as one UK newspaper puts it, a truly ‘global scheme to cap and trade carbon emissions, a global investment fund for new green technologies and action to stop deforestation.’²⁶ Carbon trading will make later additions such as taxation and a mixture of command and control measures politically acceptable. On the other hand, that is not a sign to cut and run from trading at the point when it has just got started. The calls of the US administration to replace Kyoto with an entirely separate scheme should be treated with considerable suspicion. As Michaelowa points out:

instead of suggesting alternatives, economists should concentrate on convincing policy makers how to get the long-term climate policy instruments right that build on Kyoto’s foundations.²⁷

²⁴ Jacoby, H., et al., In: Grubb, M., Vrolijk, C., Brack, D., *The Kyoto Protocol: A Guide And Assessment*. London: Earthscan, 1999, pp. 275-6.

²⁵ Yamin, F., Depledge, J., *op cit.*, pp. 572-3.

²⁶ Elliot, L., Wintour, P., Britain To Push For Global Climate Deal By 2008. *The Guardian*. Tuesday 31/10/2006, p. 1.

²⁷ Michaelowa, A., Global Warming Policy. *Journal Of Economic Perspectives*. Vol. 17, no. 3, Summer 2003, pp. 204-5.

Policy interaction concerns

Long-term, carbon trading will not make emissions reductions any cheaper - there will come a point at which it ceases to be more efficient than other methods. This is for two reasons: *first* as legal entities become increasingly harmonised,²⁸ the benefits of trade become reduced and *second* the benefits of trade diminish as abatement costs increase once efficient technologies and practises have been implemented.²⁹ While a solution to this is continuing to increase the cost of carbon, therefore forcing the incentive, 'there may be a limit on the ETS price that member states find politically acceptable...If countries such as the UK want to push for further greenhouse gas reductions, they may have to continue to explore other policy mechanisms to work alongside the ETS.'³⁰

Given that emission reduction policies in the future are likely to be highly heterogeneous, including 'carbon/energy taxes, support mechanisms for renewable electricity, and policies to promote energy efficiency',³¹ there is considerable scope for problems in policy interaction that will mire the legacy of carbon trading. For instance, for participants in two schemes, (e.g. a trading and taxation scheme), their emissions will be priced twice, but only once for legal entities outside of the scheme. This potentially provides a disincentive to participation in an ETS.

On a more general level the use of trading will have to be carefully matched with the task and target group. Trading action is useful but should not detract from the efforts of more localised policy and the initiatives of communities and individuals. As Yamin and Depledge contend:

Voluntary actions by businesses, municipalities, research bodies and epistemic networks, religious groups and consumer and civil society organisations are arguably as significant as international

²⁸ That is, their emissions levels become increasingly similar.

²⁹ - Action Against Climate Change: The Kyoto Protocol And Beyond. *Organisation For Economic Co-operation And Development*. Paris: OECD, 1999, p. 63.

³⁰ Brough, M., European Emissions Trading: Is It Working? *Utility Week*. Dec 8, 2006, Vol. 26, Iss. 13, p. 15.

³¹ Sorrel, S., Sijm, J., Carbon Trading In The Policy Mix. *Oxford Review Of Economic Policy*, 2003, Vol. 19, no. 3, p. 1.

policy-making in instigating behavioural changes necessary to move towards low- or-zero carbon-emitting economies.³²

The irony is that Kyoto fails to take into account these actions on the small scale - where reductions can take place at minimum cost. 'The lowest cost methods' according to Kahn and Franceschi, 'are the simple adjustments that can be made by small polluters such as households, retail establishments, business offices and the like.'³³ Inclusion of these groups into a trading scheme will be a plausible but difficult task.

3.4) Conclusion: Towards a sixty per cent reduction in emissions

In Chapter 1 it was demonstrated that carbon trading can be considered as an effective policy tool in meeting the reduction commitments of the Kyoto Protocol. In Chapter 2 this was developed in an exploration of the key challenges that have been (or are likely to be) experienced, predominately over the medium to long-term. In this chapter, these challenges are balanced by the useful impacts of carbon trading - giving carbon a price (and hence an economic-political worth) in the short-term, and in the long-term establishing a framework and discourse for emissions reduction that will position the world economy for further emissions cuts in the future. This represents a highly positive start for emissions reductions which is only partially tempered by the need to address the problems associated with enforcement, emissions rights, and its inability to drive R&D. These problems are intrinsic to carbon trading, and will have to be addressed by future policy if reductions are going to be successful over the long-term.

Most assessments of carbon trading have tended to swing to the poles - either wholly supporting it, or wholly criticising it. Both are flawed, and both equally dangerous for policy design in the future. This dissertation has steered a course between the two, recognising the progress it represents while presenting the case that of itself, it is a proverbial 'drop in the ocean' in comparison with the necessary structural changes

³² Yamin, F., Depledge, J., *op cit.*, p. 556.

³³ Kahn, J., Franceschi, D., Beyond Kyoto: A Tax-Based System For The Global Reduction Of Greenhouse Gas Emissions. *Ecological Economics*. 2006, no. 58, p. 782.

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required for serious emissions reductions targets to be met. This position accepts that no policy is perfect, least of all a policy addressing an issue as complex as climate change.

Similarly, most analysis has centred on the technical dimensions of making carbon trading operational. This has been at the expense of devising a way forward for carbon trading that will combine the priorities of feasibility, cost and environmental integrity more efficiently. This will require a beefed up global commitment to further emissions reductions before an effective policy package can be designed, not the other way round.

In these very early days of legislation it is important to heed the warnings of Bell on carbon trading:

We are putting our eggs into a theoretical basket constructed from vain hopes that problems like this will essentially take care of themselves.³⁴

They will not, and it is essential that the lessons of carbon trading are used to influence our future reduction policies. The limited success of trading must not be a discouragement, but must set the scene for more extensive alternatives. While our climate future is bleak, our debate with the policy options must be colourful and deep if we are to provide a meaningful legacy to those who will write the next chapter in the climate saga.

³⁴ Greenspan Bell, R., *op cit.*, p. 31.

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