Creating a Market for Clean Air: The Air Pollution Control (Amendment) Ordinance 2008

Jolene Lin[*]

The Air Pollution Control (Amendment) Ordinance 2008 was passed in July 2008. This ordinance establishes an emissions trading scheme to facilitate pollution reduction by the two electricity generation companies operating in Hong Kong. This article analyses the features of this scheme from a legal and regulatory perspective, and advances three claims. First, the regulatory authority plays a significant coordination and oversight role, which may be necessary to steer the market and to ensure the environmental integrity of the scheme. This underscores the need to be cautious of claims of the cost-effectiveness and administrative ease of emissions trading, particularly in the context of trading across jurisdictions which differ in environmental quality, laws and enforcement. Secondly, the environmental effectiveness of the emissions trading scheme is questionable given the size of the market. Finally, this article draws parallels between the Hong Kong scheme and the Kyoto Protocol's Clean Development Mechanism and argues that an independent regulatory body is essential to guarantee due process and environmental integrity.

Introduction

The Air Pollution Control (Amendment) Ordinance 2008 (the "Amendment Ordinance") was passed by the Legislative Council of the Hong Kong Special Administrative Region in July 2008.[1] This ordinance establishes an emissions trading scheme (ETS) to facilitate pollution reduction by the two electricity generation companies operating in the territory. Emissions trading programmes allow polluters to avoid pollution reductions at a regulated source, if they provide an equivalent reduction elsewhere. The equivalent reduction can be made at another source controlled by the polluter or through purchasing allowances from another facility. The Amendment Ordinance was passed with little fanfare. It may have been viewed as yet

[*] Assistant Professor, Faculty of Law, the University of Hong Kong.

[1] Order No 31 of 2008. The Bill was introduced on 6 February 2008 (Legislative Council official website, available at http://www.legco.gov.hk/english/index.htm, accessed 11 June 2008). *See* Part IVB of the Air Pollution Control Ordinance (Cap 311).

another step in the government's rather lacklustre efforts to reduce air pollution which was unlikely to yield significant results.[2] Observers may also have been sceptical of the regulatory merit of creating an ETS that would effectively involve only two market players as Hong Kong's electricity needs are met by two providers, Hong Kong Electric and China Light and Power. After all, the basic economics of emissions trading require a sizeable number of regulated entities, preferably facing significant disparities in pollution abatement costs, in order to identify cost-effective pollution reduction opportunities.[3] Interesting as the question of the scheme's cost-effectiveness may be, this paper does not seek to evaluate the economic feasibility of the ETS but to analyse its features from a legal and regulatory perspective.

This article advances three claims. First, the features of the scheme introduced by the Amendment Ordinance are such that the regulatory authority plays a significant coordination and oversight role, particularly in the approval process for the sale and purchase of emission credits. The level of regulatory oversight may be necessary to steer the market (given its small and illiquid nature) and to ensure the environmental integrity of the scheme. This underscores the need to be cautious of claims of the cost-effectiveness and administrative ease of emissions trading, particularly in the context of trading across jurisdictions which differ in environmental quality, laws and enforcement. Secondly, a major issue in emissions trading is the state of the market. If there is no active trading of allowances, there cannot be strong incentives that will influence abatement behaviour. Trading activity amongst four power plants, three of which are owned by the same company, is not likely to be vigorous. This brings the environmental effectiveness of the ETS into question. Further, the small size of the market places limitations on how far the regulators can tinker with the features of the ETS to enhance its environmental effectiveness. Finally, this article advances the argument that the Amendment Ordinance should not be viewed narrowly as simply establishing an ETS that regulates the Hong Kong power plants only. Instead, it is a preliminary step towards developing a Pearl River Delta (PRD)-wide scheme which could eventually be linked up to other

[2] Air quality in Hong Kong has deteriorated significantly in recent years and the public has expressed dissatisfaction with the government's efforts to tackle the air pollution problem and develop a long-term air quality management strategy. *See* Council for Sustainable Development's Report on the Better Air Quality Engagement Process, February 2008, available at http://www.susdev.org.hk/en/councilreport.htm (accessed 9 January 2009); Environmental Protection Department, "Review of Air Quality Objectives", available at http://www.epd.gov.hk/epd/english/environmentinhk/air/air_quality_objectives/air_quality_objectives.html (accessed 9 January 2009). The attempt by the Clean Air Foundation to challenge the government's air pollution control policy via judicial review is also an indication of the degree of public dissatisfaction; see Clean Air Foundation Limited and Gordon David Oldham v the Government of the HKSAR, Constitutional and Administrative Law List No 35 of 2007.

[3] Anil Markandya *et al*, *Dictionary of Environmental Economics* (Earthscan, 2001), p 77.

emissions trading schemes that are being implemented on the mainland. The PRD scheme is modelled on the Kyoto Protocol's Clean Development Mechanism (CDM) which allows countries facing emissions reduction targets to meet their legal obligations by earning credits for projects carried out in developing countries that do not face emission caps under the Kyoto Protocol.[4] It is arguable that, similar to the CDM, participants in a pollution reduction project under the PRD scheme face aligned incentives to maximise the number of allowances generated by a project and to decrease their price.[5] How to ensure that the PRD scheme leads to real environmental improvement is a difficult issue and if a lesson were to be taken from the experience of the CDM, would require setting up an independent regulatory body.

Part I provides a brief theoretical overview of emissions trading. Part II describes and analyses the ETS as well as develops the arguments for the first two claims made above. Part III examines the ETS as part of a wider regional scheme that is similar to the CDM. Drawing on the literature on the CDM, this part argues that the combination of aligned incentives amongst the market players and the difficulties of cross-border monitoring and enforcement warrant careful consideration of how to design an appropriate regulatory framework. Part IV concludes.

I: A Theoretical Overview

What is Emissions Trading?

There are two main types of emissions trading programs – "cap- and- trade" and "baseline credit" systems.[6] If the coverage of the ETS were limited solely to Hong Kong power plants, the scheme would be a classic cap-and-trade

[4] The Clean Development Mechanism is established under Art 12 of the Kyoto Protocol 37 ILM (1998) 22.

[5] It has been noted that rather than competing like typical market players, participants in the CDM have a common interest in demonstrating a greater level of emissions reductions from a project and exchanging a greater amount of CERs, *see* C. O'Brian and K.N. Ortega, "Three Years after Implementation, the CDM Moves Markets, and Matures in New Directions", *Latham and Watkins, Client Alert* 658, 2 January 2008, 5.

[6] K. Turner, D. Pearce and I. Bateman, *Environmental Economics: An Elementary Introduction* (Baltimore: John Hopkins University Press, 1993), p 181. There is a voluminous literature on emissions trading. *See*, generally, OECD, *Implementing Domestic Tradable Permits for Environmental Protection* (Paris: OECD, 1999); Joseph Kruger, *Companies and Regulators in Emissions Trading Programs* (Washington DC: Resources for the Future, 2005) Discussion Paper 05-03; European Environment Agency, *Using the Market for Cost-Effective Environmental Policy* (Luxemborg: EEA, 2006); R. Stavins, "Lessons from the American Experiment with Market-Based Environmental Policies" (2001) *John F Kennedy School of Government, Harvard University, Faculty Research Working Papers Series*, Working Paper No 22.2002.

scheme. The wider PRD scheme effectively combines features of cap-and-trade and baseline credit, as discussed further below.

Under a cap and trade scheme, the regulator determines an acceptable level of emissions, ie a "cap". The cap is usually a target that is lower than "business as usual" emissions levels. Once the cap is established, allowances that permit the emission of a stipulated amount of pollutant will be allocated amongst firms. The total amount of emissions allowed by the aggregate quota is equivalent to the cap. A firm that wishes to emit more than its quota has to purchase additional allowances or it risks exceeding its quota, thereby incurring criminal and/or civil liability.

Allowance trading is premised on the assumption that firms are economically rational profit-maximising actors. Therefore, a firm that can abate pollution at a cost lower than the market price of an allowance will do so up to the level where the price of abatement is equal to the allowance price. It then sells its surplus allowances to firms that find it more costly to reduce pollution than to buy allowances to meet emission targets. Cost-effectiveness is achieved when all firms abate to the point where the marginal costs of further abatement is equal to the permit price. The long-term goal of a cap and trade system is to reduce total emissions to a level below that established by the cap.[7] This can be achieved by gradually reducing the size of the cap.

In a project-based baseline credit system, the source's business-as-usual emissions baseline representing its emissions over a period of time will be calculated taking into account several factors including the source's predicted emissions growth, technological improvements and other abatement opportunities. Credits are earned when the firm carried out a project that reduces emissions to a level below its business-as-usual baseline. This mechanism lies at the heart of the CDM. Under the CDM, an Annex I Party (known as such because it is listed in Annex I to the United Nations Framework Convention on Climate Change (UNFCCC) and is legally obliged to reduce its GHG emissions by the amount stipulated in Annex B of the Kyoto Protocol), usually a developed country, can receive credits known as Certified Emission Reductions (CERs) for investing in an emissions- reducing project in a developing country. The CDM provides Annex I countries with the intrinsic incentive to invest in carbon abatement projects in non-Annex I countries where the costs of abatement are less than in developed countries.[8] The credits are tradable on international carbon

[7] K. Turner, D. Pearce and I. Bateman (n 6 above), p 183.

[8] Note that the CDM has a two-fold aim of helping Annex I Parties meet their emission targets in a cost-effective way and promoting sustainable development in the developing countries according to Art 12(2) of the Kyoto Protocol.

markets and examples of CDM projects include renewable energy, energy efficiency, and reforestation projects. In order to ensure that CDM projects generate real emission reductions, they must meet the additionality requirement. The additionality requirement may be explained as such: CDM project activities must result in reducing or absorbing (sequestering) greenhouse gases (GHGs) that are "real and measurable and would not have occurred in the absence of the proposed project activity".[9] In other words, to qualify for credits, a project activity must demonstrate that GHG emissions were reduced against the "baseline" of GHG emissions under business-as-usual circumstances.

The Theoretical Advantages of Emissions Trading

While environmental economists have studied the use of property rights to address environmental externalities for a long time, legal scholars only began to seriously look into the use of economic incentive programmes in the 1980s as dissatisfaction with US environmental policy grew and the root cause of the problems was perceived to be the nature of traditional command and control regulation.[10] It is therefore useful to keep in mind that the theoretical literature on emissions trading is heavily influenced by the American experience and many of the benefits of emissions trading are perceived vis-à-vis traditional "command and control" regulation.[11] Further, as Driesen has argued, the popularity of market-based instruments such as emissions trading has sometimes had little to do with the competing merits of the various instruments. Instead, governments which tend towards a laissez-faire free market ideology have found market-based instruments attractive.[12] This part of the article will briefly set out the arguments that

[9] United Nations Framework Convention on Climate Change (UNFCCC), Report of the Conference of the Parties on its seventh session, Marrakesh, 29 Oct–10 No 2001). Addendum part two: Action taken by the Conference of the Parties. Vol II. FCCC/CP/2001/13/Add. 2, p 20.

[10] By the late 1970s, excessive bureaucratic centralisation in the hands of the federal Environmental Protection Agency, rigidity, high costs, extensive litigation by industry and environmental groups, the consequent burden on the court system, and delay were causing great dissatisfaction with US environmental policy. Some scholars, including Ackerman and Stewart, argued that the root cause of the problems was the nature of traditional command and control regulation which depended on extensive standard-setting and did not take into account the extensive variations in the physical, social and environmental conditions across the states within the US, amongst other things. They therefore advocated the use of economic incentive systems which they argued to be more efficient and effective. *See*, for example, Richard B. Stewart, "Controlling Environmental Risks Through Economic Incentives" (1987–1988) 13 *Columbia Journal of Environmental Law* 153; Bruce A. Ackerman and Richard B. Stewart, "Reforming Environmental Law: The Democratic Case for Market Incentives" (1987–1988) 13 *Columbia Journal of Environmental Law* 171.

[11] *See* David M. Driesen, "Is Emissions Trading an Economic Incentive Program?: Replacing the Command and Control/Economic Incentive Dichotomy" (1998) 55 *Washington and Lee Law Review* 289 for discussion about the fallacy of this dichotomy.

[12] David Driesen, "Economic Instruments for Sustainable Development" in Benjamin J. Richardson and Stepan Wood, *Environmental Law for Sustainability* (Hart Publishing, 2006).

have been advanced in support of emissions trading, though by no means are these claims free from contention.[13]

First, emissions trading is said to achieve large cost savings by giving firms with relatively low pollution control costs the incentive to control above the level mandated by uniform regulation, while allowing firms with high costs to abate less. This minimises overall compliance costs. In jurisdictions where competitiveness is a significant concern, minimising compliance costs allays concerns that environmental regulation may put domestic companies at a competitive disadvantage vis-à-vis foreign companies and force industries to relocate to jurisdictions with more lax or less costly environmental regulation.[14] There is little empirical support for the argument that firms will relocate because of the costs of environmental regulatory compliance, especially since such costs would form an almost negligible percentage of a firm's overall operating costs and a firm's decision to relocate, especially after investment capital has been "sunk", would be affected by other considerations such as labour costs, tax treatment and market access.[15] However, to the extent that concerns about competitiveness exist, emissions trading is an attractive regulatory option because it purports to minimise the costs of environmental clean-up.

Secondly, emissions trading is said to encourage flexibility in control technologies. According to such arguments, command and control regulation tends to mandate the use of specific technology or abatement method, yet regulators are often not the best people to decide on the choice of abatement methods because they lack sufficient information regarding a firm's abatement costs. Thus, giving firms the freedom to decide on their preferred abatement methods promotes better regulation while benefiting firms.[16]

Thirdly, emissions trading provides an ongoing incentive (ie that firms can make money by doing so) to invest in environmentally superior technologies and devise new products to further reduce pollution. Stewart argues that such technological innovation is vital for maintaining long-term eco-

[13] *See* discussion in R. Baldwin, "Regulation Lite: The Rise of Emissions Trading" (2008) 2 *Regulation and Governance* 193, 196–205.

[14] Conversely, environmentalists are concerned that competitiveness concerns will induce states to lower environmental standards for fear that companies and industries will relocate to states with less strict environmental regulation, leading to a downward spiral in environmental standards as states adjust and readjust their standards to "attract" investment until neither state has an incentive to change its standard further. *See* R. Revesz, "Rehabilitating Interstate Competition: Rethinking the 'Race-to-the-Bottom' Rationale for Federal Environmental Regulation" (1992) 67 *New York University Law Review* 1210, 1213–1215.

[15] D.C. Esty and D. Geradin, "Environmental Protection and International Competitiveness: A Conceptual Framework" (1998) 32 *Journal of World Trade* 5.

[16] Robert W. Hahn and Robert N. Stavins, "Incentive-Based Environmental Regulation: A New Era from an Old Idea?" 18 *Ecology Law Quarterly* 109.

nomic growth without simultaneously increasing pollution and other forms of environmental degradation.[17] Further, innovation will support the development of environmental technology and services markets.

Fourthly, some scholars argue that emissions trading, being an economic incentive system, places fewer demands upon institutions and human resources than command and control regulation does.[18] While command and control regulation would require frequent site inspections to verify that compliance standards are being met or the prescribed pollution reduction equipment is being used, these scholars suggest that emissions trading schemes entail relatively lower regulatory costs as they run on their own accord once the system is put in place.

Fifthly, emissions trading can be used to provide the government with an appropriate and significant source of revenue.[19] Firms, by purchasing permits to emit pollutants, may be regarded as effectively paying for the privilege of using the public's air resources.

Finally, Stewart and Ackerman argue that emissions trading can enhance the democratic accountability of environmental policy decisions. Public discussions on emissions trading can avoid the technical jargon and technological questions that bewilder most people apart from the technocrats. Instead, the discussion can focus on the basics of which risks should be controlled, and by how much. "The great virtue of the marketable permit program is that it puts the question in an operational form accessible to the general public".[20]

II: The Emissions Trading Scheme for Hong Kong's Power Sector

The Air Pollution Control Ordinance (APCO) is the principal law for managing air quality in Hong Kong, and regulates air pollution such as power plant emissions, motor vehicle fuel composition and emissions, asbestos control, construction dust and industrial emissions.[21] Section 13 of the APCO requires the licensing of premises to be used for the conduct of "specified processes". Schedule 1 of the APCO sets out a list of specified

[17] Richard B. Stewart, "Regulation, Innovation and Administrative Law: A Conceptual Framework" (1981) 69 *California Law Review* 1259.

[18] Panayotou, *Economic Instruments for Environmental Management and Sustainable Development* (Geneva/New York: United Nations Environment Programme, 1994); Richard B. Stewart, "Controlling Environmental Risks Through Economic Incentives" (1987–1988) 13 *Columbia Journal of Environmental* Law 153, 160.

[19] Richard B. Stewart, "Controlling Environmental Risks Through Economic Incentives" (1987–1988) 13 *Columbia Journal of Environmental Law* 153, 160.

[20] Bruce A. Ackerman and Richard B. Stewart, "Reforming Environmental Law: The Democratic Case for Market Incentives" (1987–1988) 13 *Columbia Journal of Environmental Law* 171, 189.

[21] Cap 311.

processes, including electricity generation involving the burning of fossil fuels in a facility of installed generation capacity exceeding five megawatts. As such, all four power plants operated by China Light and Power and Hong Kong Electric, hold licenses to conduct specified processes through which the environmental authority regulates their atmospheric emissions. The definition of "Specified License" was introduced by the Amendment Ordinance, and refers only to the licenses issued to the power plants under section 13 of the APCO, presumably because the ETS applies to the power sector only.[22]

In order to meet the 2010 pollutant reduction targets jointly agreed upon by the HKSAR government and the Guangdong provincial government in 2002, the power companies were informed of these targets in 2003, and of the fact that the environmental authority would set emission caps in any specified licenses issued or renewed henceforth.[23] It can be inferred that during the period between 2003 and 2008 (when the Amendment Ordinance was passed), the authority and the power companies were engaged in negotiations over the imposition of emission caps which the power companies are likely to have resisted. As with the introduction of emissions trading in other jurisdictions, particularly California's RECLAIM scheme and the sulphur dioxide Title IV program in the United States,[24] the ETS is

[22] "[S]pecified license" is defined as "a licence to conduct the process specified in item 7 of Sch 1, other than a licence to conduct such process for the sole purpose of providing a stand-by power supply in the event of a loss of normal power supply". Item 7 of Sch 1 refers to "Electricity Works".

[23] HKSAR Environmental Protection Department, "Government's Environmental Policy for the Power Sector", available at http://www.epd.gov.hk/epd/english/environmentinhk/air/prob_solutions/air_problems.html (accessed 15 January 2009). In April 2002, as a step towards improving regional air quality, the Hong Kong government and the Guangdong Provincial Government "reached a consensus…to reduce, on a best endeavour basis" the emissions of four major air pollutants, namely sulphur dioxide (SO_2), nitrogen oxides (NOx) respirable suspended particulates (RSP) and volatile organic compounds (VOC) by 40, 20, 55 and 55% respectively in the region by 2010. This agreement between the Hong Kong government and the Guandong Provincial Government is described as a "consensus…on a best endeavour basis" in the Legislative Council Brief on the Air Pollution Control (Amendment) Bill 2008 (File Ref: EP CR 9/150/21) as well as the January 2008 report by the Environmental Protection Department to the Legislative Council Panel on Environmental Affairs, "Progress of Measures to Improve Air Quality" (File Ref: CB(1) 647.07-08(15)) ("EPD January 2008 report"). The Secretary of the Environment Edward Yau has, however, described the agreement as a "bilateral binding agreement"; *see* Secretary for the Environment Edward Yau, "HK, Guandong pact a launching pad", Address at the Hong Kong Institution of Engineers' Environmental Division Annual Seminar on "Environmental Policies and Practices in the Mainland and the HKSAR" 9 April 2008, available online at http://news.gov.hk/en/category/ontherecord/080409/html/080409en11002.htm (accessed 12 June 2008). This suggests that the obligation to meet the 2010 emission reduction targets is legally binding (and therefore not to be pursued on a best endeavour basis only) or that the Hong Kong government regards the agreement as a significant platform for cross-border environmental cooperation and therefore de facto binding, though not de jure.

[24] A. Denny Ellerman, "The US SO_2 Cap-and-Trade Programme" and David Harrison, "Ex Post Evaluation of the RECLAIM Emissions Trading Programmes for the Los Angeles Air Basin" in *Tradable Permits: Policy Evaluation, Design and Reform* (Organisation for Economic Co-operation and Development, OECD, Paris, 2004).

likely to have been a quid pro quo for the power companies' agreement to the emission caps. It should be noted that the authority does not have much bargaining power due to the statutory limitations on its discretionary power to impose or amend license conditions. Section 17 of the APCO grants the authority discretion to impose new or amended terms or conditions on a license which is already in force if it considers such action necessary in the public interest. However, this power is subject to the limitation that "[u]nless the Authority considers that the continuation of the specified process to which the licence relates would be, or be likely to be, prejudicial to health he may exercise [this power] only with the prior approval of the [Chief Executive], as to both the exercise of the power and the manner of the exercise of the power, or with the agreement of the licence holder". The difficulty of proving that power generation would be or is likely to be prejudicial to health would have precluded the option of acting without the Chief Executive's approval or the licence holder's agreement. Further, given the powerful economic interests at play, and the pragmatic need to maintain cordial relations between the regulated entities and the regulator, acting under section 17 would be a measure of last resort.

The key features of the ETS are as follows. Each specified license will be allocated a quantity of allowances for each pollutant (namely, sulphur dioxide, nitrogen oxides, and respirable suspended particulates) on an annual basis.[25] The allowances are allocated according to market share of the local power generation market.[26] The license holder's legal obligation is to ensure that actual emissions from the licensed premises do not exceed the permissible level of emissions each year. However, as described earlier in Part I, emissions trading gives the license holder the option of acquiring allowances in lieu of reducing the pollution itself. The overall environmental benefit is the same – one tonne of a pollutant is prevented from entering the atmosphere.[27] Section 26L provides the legal basis for the acquisition and transfer of allowances amongst the power plants. Section 26M gives the power plants the option of acquiring "emission credits" which for compliance purposes have the function and value of an allowance, but are created by pollution reduction projects carried out under the Implementa-

[25] Section 26G(2) states that, in deciding on the allocation of allowances, the Secretary of the Environment shall have as his purpose the attainment and maintenance of any relevant air quality objective, have regard to the best practicable means for pollution control, and whether the emissions of that type of pollutant would be, or be likely to be, prejudicial to health.

[26] *See* Annex 2 of draft Technical Memorandum (TM) in "Bills Committee on Air Pollution Control (Amendment) Bill 2008, List of Follow-up Actions Arising from the Discussion at the Meeting on 19 May 2008" Document Ref: CB(1) 1643/07-08(02). In the draft TM, market share is in reference to the period from 1999 to 2003 inclusive.

[27] "[E]mission allowance" is defined as "the entitlement to emit one tonne of that type of pollutant in an emission year from a licensed premises; and, for the avoidance of doubt, each such entitlement is quantified as one emission allowance."

tion Framework of the Emission Trading Pilot Scheme for Thermal Power Plants in the Pearl River Delta Region. This scheme will be discussed in detail in Part III below. The government's original intention was to allow the power plants unfettered freedom to acquire emission credits. However, in response to concerns raised in the Legislative Council discussions that the acquisition of credits would allow the power plants to do next to nothing to improve local air quality, section 26M now provides that a power plant may acquire in one year a total quantity of emission credits equivalent to no more than 15 per cent of the quantity of emission allowances allocated to it in that year.[28] Further, the environmental agency is required to consult the Advisory Council on the Environment before it decides on an application for the acquisition of emission credits.[29] Section 26K provides for force majeure events, including the non-delivery of emission credits under a sale and purchase agreement. Under section 30B, a specified license holder that exceeds its emission cap faces monetary penalties and imprisonment (on second or subsequent convictions). Providing false information is also a punishable offence under section 30B.

Every acquisition or transfer of allowances and credits has to be reviewed and approved by the environmental agency. In a larger scheme, this sort of approval process might pose concerns about transaction costs but these costs are arguably negligible in a scheme regulating four power plants. In fact, given the duopolistic nature of the power sector (and therefore the emissions market), it is probably necessary for the regulator to play an active role to prevent anti-competitive behaviour. The counter-argument that extensive regulatory intervention will hinder market development is moot as long as the power sector is not liberalised. The extent of the environmental agency's monitoring and enforcement role would also have been driven by concerns to ensure that the scheme is environmentally effective and brings about real pollution reductions in Hong Kong. Such concerns are particularly valid when it comes to allowing power plants to purchase emission credits from mainland power plants, as evidenced by the restriction on the amount of credits that local power plants can purchase in each emission year and additional steps in the approval process. The need for a relatively high level of regulatory oversight and enforcement underscores the need to be cautious of claims of the cost-effectiveness and administrative ease of emissions trading, particularly in the context of trading across jurisdictions which differ in environmental quality, laws and enforcement.

[28] Bills Committee on Air Pollution Control (Amendment) Bill 2008, List of follow-up actions arising from the discussion at the meetings on 3, 5 and 6 June 2008, Document Ref: CB(1) 1873/07-08(03).

[29] Section 26M(6).

The size of the ETS market also poses difficult questions. In a market that comprises of four power plants, three of which are owned by the same company, active emissions trading is unlikely to take place. Yet, in the absence of active trading, there cannot be strong incentives that will influence abatement behaviour. The inability of the ETS to create the appropriate incentives for market players to abate their pollution brings its environmental effectiveness into question. Further, the small size of the market places inherent limitations on the extent to which the regulator can modify certain features of the ETS to enhance environmental effectiveness. For example, some emissions trading schemes such as the US Title IV sulphur dioxide program permit the participation of individuals, citizen groups and private companies. This creates another avenue for the public to play a role in environmental governance through buying and "retiring" allowances to realise an environmentally more stringent emissions cap. As such schemes involve a significant number of regulated entities, there is usually sufficient market liquidity to buffer against price shocks. Small schemes like the Hong Kong ETS will find it difficult to manage price volatility risks when environmentally-motivated actors seek to retire large number of allowances. Hypothetically, this could lead to a situation where the regulator has to intervene with a price ceiling or halt trading to restore market stability. Once again, an ETS has to be of a certain size in order to be environmentally effective. Using emissions trading to regulate the power sector appears to require more justification. Baldwin's observations that emissions trading is all too often a politically convenient panacea and that its virtues really lie in its "acceptability" because it is non-threatening to the most powerful interests seem to be apt in this case.[30]

Part III below advances a different perspective on the ETS by placing it within a regional context and arguing that the ETS can be seen as a springboard for developing a Pearl River Delta (PRD)-wide scheme that could significantly improve air quality in the regional air shed (which includes Hong Kong).

[30] R. Baldwin, "Regulation Lite: The Rise of Emissions Trading" (2008) 2 *Regulation and Governance* 193–215.

III: A Regional "Clean Development Mechanism"

Instead of viewing the Amendment Ordinance as simply establishing an ETS that regulates the Hong Kong power plants only, it can be seen as a preliminary step towards developing a Pearl River Delta (PRD)-wide scheme which could eventually be linked up to other emissions trading schemes that are being implemented on the mainland. The legal framework for such a regional scheme was put in place in 2007, but was not effective for reasons that will be explained below. In the following discussion, we will examine the background to the formation of a regional ETS and how the PRD scheme resembles the Kyoto Protocol's Clean Development Mechanism (CDM). As in the case of the CDM, participants in a pollution reduction project under the PRD scheme face aligned incentives to inflate the amount of credits claimed. The more successful the PRD scheme is at generating credits, the more credits are available to Hong Kong power plants (and potentially other power plants on the mainland if the PRD scheme is linked to the other emissions trading schemes that are being developed on the mainland) to meet their emissions targets, and therefore the more important it is that each credit corresponds to real and measurable emission reductions. How to ensure that the PRD scheme leads to real environmental improvement, and not the creation of "hot air" credits, is a difficult issue. It will be argued below that a body independent of the environmental authorities which is tasked to evaluate and approve projects according to stringent environmental standards is necessary.

Background to the Development of a Regional ETS

Rapid industrialisation and urbanisation in Hong Kong and Guangdong has led to worsening air quality in the entire Pearl River delta region which shares a common air shed.31 (Note, however, that while regional sources certainly have an impact on Hong Kong's air quality, recent research indicates that local sources are the crucial factor affecting the territory's air quality more than 50 per cent of the time. It is therefore clear that reducing air pollution in Hong Kong can have a significant positive impact on local air quality.32) Emissions trading found its way onto the agenda as a joint initiative between the Hong Kong and Guangdong authorities to reduce air pollution in the PRD region. In January 2007, five years after the Spe-

[31] For discussion, *see* Lisa Hopkinson and Rachel Stern, "One Country, Two Systems, One Smog: Cross-Boundary Air Pollution Policy Challenges for Hong Kong and Guangdong" (2003) *China Environment Series* 6 (Washington DC: Woodrow Wilson International Center for Scholars).

[32] Alexis Lau et al, "Relative Significance of Local vs. Regional Sources: Hong Kong's Air Pollution" (2007) (Hong Kong: Institute for the Environment (HKUST), ADM Capital Foundation, Civic Exchange), available online at http://www.cleanairnet.org/caiasia/1412/article-71393.html (accessed 10 February 2008).

cial Panel on PRD Air Quality Management and Monitoring first proposed emissions trading as one of the measures to facilitate pollution reduction, the Pilot Scheme for Thermal Power Plants in the PRD Region was launched.[33]

The pilot scheme is voluntary in nature and, as its name suggests, is a learning-by-doing exercise to familiarise regulators and regulated entities alike with this relatively novel and complex environmental regulatory tool. The scheme provides for the Guangdong and Hong Kong authorities to impose emission caps on the power plants within their respective jurisdictions.[34] The guidelines contained in the Implementing Framework are premised on the assumption that projects will be initiated by trading partners identified from the outset who must submit plans for approval by the authorities (of the respective trading partners). It is further assumed that the credits seller will be a Guangdong power plant, and the buyer a Hong Kong power plant. Given that the Implementation Framework is silent on many significant operational and legal issues and there has been no impetus to develop projects to generate credits for compliance purposes, it is not surprising that there has not been any recorded activity under the Pilot Scheme so far.

The Amendment Ordinance provides a legal framework that removes some of the uncertainties and risks that deterred Hong Kong power plants from carrying out emission reduction projects in the PRD region. It clarifies some of the important legal and operational issues that were not addressed in the Implementation Framework for the Pilot Scheme for Thermal Power Plants in the PRD Region, such as the legal basis for the use of cross-border credits by Hong Kong power plants, the relationship between the Pilot Scheme and the overall air pollution control legal framework to which Hong Kong power plants are subject, the method of allocating allowances, and how the authorities will address force majeure events such as the non-delivery of credits by a Guangdong power plant. The imposition of caps on the Hong Kong power plants will also be crucial for creating the demand for emission credits that will give the regional scheme a kick-start.

Drawing Lessons from the Clean Development Mechanism

While there are limitations to the comparison that can be drawn between the PRD scheme and the CDM because of the differences in scale and complexity, it is worth looking to the CDM for the purpose of comparative analysis because it is by far the largest and most developed emissions offset

[33] "Implementation Framework of the Emissions Trading Pilot Scheme for Thermal Power Plants in the Pearl River Delta Region (the Pilot Scheme)", Annex to *Emissions Trading Pilot Scheme for Thermal Power Plants in the Pearl River Delta Region* (CB(1) 972/06-07(05), February 2007).

[34] *Ibid*, para 3.2.

market ever created and to put it succinctly, "[i]f one wants to study offsets in the real world, one studies the CDM".[35]

The PRD scheme is an "offset" program, that is, the emission credits issued are a measure of the quantity of emissions that has been avoided or "offset" by pollution reduction projects. As in the case of the CDM, the use of offsets is likely to be perceived to be a win-win solution because they offer the Hong Kong power plants a low-cost pollution reduction option and offer the mainland power plants a source of funding to reduce the pollution intensity of their energy production. However, because the project developers, the buyers of credits, and their respective governments have an inherent interest in either maximising profits or reducing compliance costs, they are no guarantors for the environmental integrity of projects. With this constellation of aligned incentives and the absence of a corrective system of checks and balances, the appropriateness of relying on offsets to reduce air pollution in the PRD region is questionable. Some scholars have argued in the context of the CDM that it is impossible to resolve the inherent tension between the demands of the market and environmental integrity and caution against the extensive use of offsets in climate change policy.[36] Others continue to believe that well-designed offset markets can play a role in engaging developing countries and encouraging investment in low-cost emission control strategies and their scholarship focuses on improving the design and governance of the CDM.[37]

A key institutional feature of the CDM governance structure is the Executive Board, a United Nations (UN) body which is responsible for the day-to-day supervision of the CDM. It is in effect a supranational regulatory agency.[38] Amongst other things, the Executive Board takes decisions on methodologies and projects, mandates reviews and revisions to project applications, and issues the UN-approved credits upon verification by independent third-party auditors known as Designated Operational Entities (DOEs). With regard to ensuring the environmental integrity of the CDM, Voigt has argued that only the Executive Board has the capacity and sole responsibility to do so.[39] The Executive Board is effectively the only feasible

[35] M.W. Wara and D.G. Victor, "A Realistic Policy on International Carbon Offsets", *Program on Energy and Sustainable Development at Stanford University*, Working paper #74, April 2008, 9.

[36] *Ibid*.

[37] For example, C. Voigt, "Responsibility for the Environmental Integrity of the CDM: Possibilities for Judicial Review of Executive Board Decisions" in D. Freeman and C. Streck (eds), *Legal Aspects of Carbon Trading: Kyoto, Copenhagen and Beyond* (Oxford University Press, 2009, forthcoming) (on file with author), C. Streck, "The Governance of the CDM: the Case for Strength and Stability" (2007) 2 *Environmental Liability* 15, 91–100

[38] This characterisation of the Executive Board as akin to a regulatory agency is not far-fetched; *see* R. Stewart, "U.S. Administrative Law: A Model for Global Administrative Law?" (2005) 68 *Law and Contemp. Problems* 63–109, 91.

[39] C. Voigt, n 37 above.

check on the worthiness of credits, given that all the parties involved in developing a project face aligned incentives to procure more credits and there are little, if any, incentives for the parties to ensure that these credits reflect real GHG reductions.

The PRD scheme does not envisage the creation of a regulatory body akin to the Executive Board, that is, an entity that is independent of the environmental authorities whose sole responsibility is the administration of the emissions trading scheme, including the monitoring and verification of projects. Instead, regulatory oversight of the projects will be provided jointly by the Hong Kong and Guangdong environmental authorities. This does not bode well for the environmental integrity of the scheme – an independent body is necessary to provide a check against the inherent incentives of all parties, including the environmental authorities, to reduce compliance costs or maximise profits. Such an independent body is all the more necessary because the traditional checks and balances on executive action provided by judicial review and administrative procedures such as notice-and-comment requirements in rule-making will not apply to the PRD scheme without great difficulty. It is arguable that a Hong Kong power plant involved in developing a cross-border pollution reduction project under the PRD scheme does so on the legal basis provided by section 26M of the Amendment Ordinance. A decision by the Hong Kong environmental authority is susceptible to judicial review by the Hong Kong courts, but what about decisions jointly taken with its Guangdong counterpart? It is impossible to imagine the courts extending its jurisdiction to review the decisions of a foreign executive agency or apportioning a jointly-made decision such that only that part of the decision made by the Hong Kong authority can be judicially reviewed. In any case, judicial review is not the appropriate mechanism for ensuring the environmental integrity of the scheme. It is highly unlikely that a Hong Kong power plant will seek judicial review out of concern that a project's environmental merit is questionable. The courts also do not possess the technical expertise to evaluate a project's environmental soundness. These considerations point towards the conclusion that a body independent of both environmental authorities is required to evaluate, monitor, and verify the pollution reduction projects if environmental integrity of the scheme is a priority.

An independent regulatory body does not need to be accompanied by a complex monitoring and approval system. The scheme is, after all, not a large one and there is no need to kill regulatory innovation with bureaucracy. For example, there is no need to have third-party verification akin to that performed by the DOEs within the CDM system. In fact, the DOE verification system has been heavily criticised for its inefficacy and many projects undergo supplementary review after verification has been

performed by DOEs because the Executive Board hesitates to rely on the reports submitted by the DOEs.[40] It is beyond the scope of this paper to develop a design blueprint for this proposed regulatory body, but the point, to reiterate, is to create a body that can provide regulatory oversight independent of the environmental agencies in order to ensure that projects carried out under the PRD scheme result in real reductions in sulphur dioxide, nitrogen oxides and RSPs, the pollutants that currently reduce quality of life for the people living in the PRD region.

IV: Conclusion

This article has discussed the latest regulatory innovation in air quality management in Hong Kong. The use of emissions trading to address air pollution, especially that caused by stationary and large sources such as industrial facilities and power generation plants, is theoretically sound and even superior because of the perceived advantages of cost-effectiveness and administrative ease. More importantly, the political acceptability of emissions trading by powerful economic interests has rendered it an extremely popular environmental regulatory instrument today. However, as this article has ventured to argue, emissions trading works only in certain circumstances and its application in Hong Kong to reduce the pollution caused by power generation is of dubious regulatory merit. Seen as part of a wider development of a regional scheme, there is potential for emissions trading to deliver cost-effective pollution reduction in one of the world's most economically vibrant areas which has also experienced great environmental degradation in recent decades. The importance of the scheme's environmental integrity cannot be over-emphasised and this paper has argued that an independent regulator is necessary. On a concluding note, air pollution policy in Hong Kong will continue to require significant tweaking in the years to come as air quality is a perennial concern. Cross-border cooperation in environmental matters appears set to continue apace. The experiment in a regional emissions trading scheme is still in its early stage, and it will be interesting to watch how developments unfold.

[40] M.W. Wara and D.G. Victor, "A Realistic Policy on International Carbon Offsets", *Program on Energy and Sustainable Development at Stanford University*, Working paper #74, April 2008, 19.