

Governing climate change in Hong Kong: Prospects for market mechanisms in the context of emissions trading in China

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Abstract: *Hong Kong continues to struggle over which environmental governance approach is in its best interest while fulfilling its environmental obligations. With regard to climate change, Hong Kong's approach is characterised by a passive form of governance that is highly dependent on China's national policy directions. This is reflected, for example, in Hong Kong having not set its own mitigation targets. Market mechanisms have received little attention in developing a city-wide climate change strategy. A transformative impulse, China's national emissions trading scheme, may provide momentum to a market-based approach. However, the necessary conditions for such a market mechanism to be successfully implemented in China remain relatively undeveloped. This raises question about early participation by Hong Kong. Direct benefits are likely to be limited, due to Hong Kong's economic structure and weak demand for emissions reduction. Besides, there are regulatory barriers to enforcing emissions targets and/or recognising emissions allowances and credits from China. We therefore argue that nationwide emissions trading may, at this time, present more challenges than opportunities for Hong Kong to leverage its efforts on climate change mitigation. An alternative is to promote voluntary emissions trading that will require active involvement and leadership by businesses.*

Keywords: *China, climate change, emissions trading, environmental governance, Hong Kong*

Introduction

Climate change is accelerating in part because greenhouse gases (GHGs) continue to be emitted and accumulate in the atmosphere. Hong Kong, with a population of 7.3 million, records high levels of per capita GHG emissions. The Hong Kong government and its citizens will have to bear the high costs of the increasingly extreme global climate change-driven weather events predicted for the 21st century (Francesch-Huidobro and Mai, 2012; Fok and Cheung, 2012). It is in Hong Kong's interest to scale up its efforts towards climate change mitigation.

To mitigate GHGs, emissions trading schemes (ETSs) have been introduced to several cities and provinces of the People's Republic of China (PRC). These schemes warrant serious consideration by policymakers in Hong Kong, which has been a Special Administrative Region (SAR) of China since 1997. In Hong Kong, market mechanisms have garnered legislative

support in certain areas but have received little attention in the formulation of a city-wide climate change strategy. Little progress in institutional innovation has been made since the release of a public consultation paper on climate change in 2010 (Environment Bureau, 2010).

This paper reviews the policy challenges to Hong Kong and discusses the prospects for using market mechanisms to govern climate change. The Chinese central government is expected to launch a national ETS in or after 2017, a scheme that may eventually become the world's largest. But carbon emissions trading remains a novel concept in Hong Kong. There is little impetus in the local political and institutional environment for the adoption of this internationally well-received policy tool. This precludes Hong Kong's environmental policy institutions from moving towards a new paradigm that respects sustainability principles. Nonetheless, transformative forces could be derived from Mainland China.

This paper presents an informed discussion on whether China's recent progress in domestic carbon trading could provide an opportunity for Hong Kong to overcome some of these challenges. By making use of a market mechanism with worldwide appeal, Hong Kong could benefit from national coordination and the economies of scale resulting from the large volume of carbon trades across Mainland China. However, the capacity of China's regulatory institutions, infrastructure and administrative practices for operating ETS falls short of international standards.

Climate policy landscape in China

In China, national environmental planning and management are state-driven. Towards the end of the 1990s, the Chinese government increasingly recognised that global climate change would pose significant macro-economic challenges to the country and should be integrated with the state's economic portfolios. Thus, in 1998, the top-tier National Coordination Group of Climate Change was reorganised and relocated from the then State Meteorological Bureau to the predecessor of the National Development and Reform Commission (NDRC) (Qi and Wu, 2013). These institutional arrangements effectively re-defined climate change in terms of development and opened up a new policy space, bringing it closer to national priorities, notably economic development.

During 2011 and 2014, China made big plans and significant commitments for the years ahead. At the Asia Pacific Economic Cooperation Summit held in Beijing in November 2014, China and the USA jointly announced a landmark climate change agreement, which confirmed that China will peak its carbon emissions and increase the share of non-fossil fuel to 20% by 2030. This is the first time that the world's largest GHG emitter (i.e. China) has promised to put an end to the growth of its GHG emissions.

In China, climate change impacts are understood primarily in macro-economic terms. The NDRC assumes formal responsibility for formulating climate change policies. It is a powerful agency within the Chinese central

government and oversees the portfolio of devising economic and social development strategies primarily to maximise economic growth and improve the well-being of the nation. While the NDRC tends to focus on those initiatives that are directly linked to development, rather than the climate or the environment, it has the authority and ability to integrate climate change into the nation's economic policy agenda more closely and effectively than the Ministry of Environmental Protection could. The transfer of policymaking responsibilities from a technical agency to a macro-economic one signalled a paradigm shift in domestic climate change governance.

Throughout the period of the 11th 'Five-year Plan' (2006–2010), GHG control in China was achieved largely through direct regulation. China generated 6275 metric tonne CO₂ in 2007 (International Energy Agency, 2015) and became the world's largest CO₂ emitter that year. The Chinese government managed to reduce energy intensity by 19.06% by the end of 2010 against the 11th Five-year Plan targets, thanks to the extended use of the 'visible hand', that is, political intervention (Wu, 2011), and formal, coercive requirements on energy consumption (Gilley, 2012). Market-based instruments played a limited role. As the marginal success in meeting the intensity targets came with significant costs, the central government decided to search for alternative strategies. Market-based instruments immediately received attention from senior government officials.

China has declared a plan to introduce ETS across the country. The NDRC has approved seven pilot sites across the country, including Guangdong Province and Shenzhen City, which are adjacent to Hong Kong. A national scheme will be set up in or after 2017 (Department of Climate Change, 2015); it is expected to cover 3–4 billion tonnes of GHG emissions and about 10 000 enterprises across China (Environomist, 2016, p.30). China's enormous annual GHG emissions output has the potential to make the Chinese carbon market the world's largest (Lo and Howes, 2013, 2015; Lo, 2015a,b).

China's ETSs may help to minimise the costs of GHG emissions reduction, promote business engagement and establish links with the international and regional carbon markets

currently operating in such jurisdictions as the European Union. As the cost-reducing capacities of ETS depend, among other factors, on the size and liquidity of the carbon market, it is in China's interest to bring together a number of provinces and cities in the national scheme and link them with those operating in other regions or countries. Considering its advantages in regulation and attracting capital, Hong Kong seems an ideal candidate for strategic engagement as an official trading region under the proposed scheme.

Climate policy landscape in Hong Kong

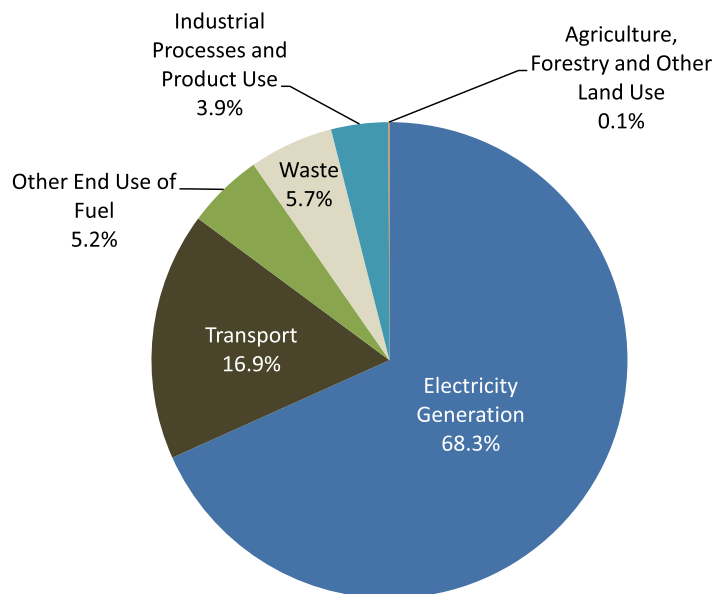
Policy directions

As an SAR of the PRC, Hong Kong is granted a number of economic and political privileges under the constitutional principle of 'one country, two systems'. For example, the SAR is not required to adopt national climate change policies and emissions reduction targets that cover the rest of China. Hong Kong's per capita CO₂ emissions rose from 6.03 tonnes in 2004 to 6.41 tonnes in 2013, exceeding the

Organisation for Economic Co-operation and Development European average (6.34 tonnes) by a small margin (International Energy Agency, 2015). About two-thirds of these emissions are produced in the process of electricity generation (Fig. 1). This steady increase in per capita emissions has met with a lukewarm response from the SAR government. A comprehensive climate change strategy was absent from the policy agenda until 2010, when the Hong Kong government, for the first time, dedicated a public consultation exercise to climate change issues (Environment Bureau, 2010). The Hong Kong government attempted to develop a city-wide climate change strategy by proposing a number of strategies and measures, including a target to reduce carbon intensity by 50–60% below the 2005 level by 2020 and other energy initiatives (Environment Bureau, 2010).

As in China, Hong Kong attempts to move away from the conventional 'command-and-control' approach and makes use of market mechanisms for managing its environmental impacts. However, elements of market mechanisms have not been put into consideration for controlling

Greenhouse Gas Emissions in Hong Kong by Sector (2013)



Source: Environmental Protection Department (www.epd.gov.hk)

Figure 1. Greenhouse gas emissions in Hong Kong by sector [Colour figure can be viewed at wileyonlinelibrary.com]

GHG emissions. The latest climate change policy report released in 2015 by the SAR government has merely emphasised its current efforts and plans about monitoring and reducing building energy consumption and promoting transport fuel switch and the use of public transport (Environment Bureau, 2015). It has neither specified an absolute emissions reduction target nor proposed any major institutional innovation.

The policy agenda has faced criticism for lacking substance and being incremental in nature (Ng, 2012; Mah and Hills, 2016), as well as for perpetuating the administrative–rationalistic and technocratic approach to environmental policymaking prevalent in Hong Kong prior to 2000 (Hills, 2004; Francesch-Huidobro, 2012). The city's dependence on mainland China's policy directions and its own institutional traditions contribute to the policy impasse.

Dependence on national commitments

Studies have found local climate change governance to face two seemingly intractable problems. First, Hong Kong is not intrinsically motivated to adopt ambitious emissions reduction targets. It lacks domestic incentives to do so, because its commitments are influenced by the national climate change policy set by the Chinese central government (Francesch-Huidobro, 2012, 2014; Mah and Hills, 2016; Ng, 2012). Hong Kong's passive form of climate change governance is highly dependent on national policy direction.

Hong Kong's status as an SAR of the PRC rather than a sovereign state has undermined the agency of local institutions to deal with regional and global environmental issues, notably climate change. As a non-Annex I Party to the Kyoto Protocol, the PRC is not subject to binding emissions reduction targets. Hong Kong is represented in the international treaty as a member jurisdiction of the PRC and therefore is not obligated to curb its own GHG emissions. Priority is often given to other environmental issues such as air pollution (Ng, 2012).

The lack of government leadership in Hong Kong is another cause of the impasse (Mah and Hills, 2016). Hong Kong has made slow progress in producing institutional innovations to deal with climate change, partly because it is not subject to strong international pressure to

curb GHG emissions, and lacks a national mandate as well as the power and legitimacy to lead cross-boundary cooperation and mobilise civil society resources. Moreover, despite its high level of per capita emissions, Hong Kong's aggregate emissions level remains relatively low (46 million tonnes of CO₂), compared with that of China (8977 million tonnes of CO₂) and other major GHG-emitting countries such as Japan (1235 million tonnes of CO₂) (International Energy Agency, 2015). As a small GHG emitter without sovereign power, Hong Kong is unlikely to make significant contributions to climate change mitigation and policy development at the global/international or even regional level, while the costs required may be prohibitive due to diseconomies of scale. These constraints discourage the Hong Kong SAR government from unilaterally scaling up its efforts to reduce GHG emissions and formulate a comprehensive climate change strategy.

Solutions to this policy problem must recognise Hong Kong's constitutional status as an SAR of the PRC and acknowledge the relatively small scale of its emissions output. The city's chief executive (i.e. head of government) and secretaries (i.e. cabinet ministers) are appointed by the Chinese central government. The strong dependence on national commitments and the growing incentives for and pressure on the PRC to act suggest that the prospects for Hong Kong scaling up its own commitments hinge upon the central government's leadership in climate change governance. Hong Kong policymakers should therefore examine the conditions for strengthening policy integration with China's climate change initiatives. As Mah and Hills (2016) argue, Hong Kong is merely a passive follower of the PRC's climate change regime, a view that seems to challenge the widespread belief that world cities have moved well ahead of nation-states in climate change governance (Bulkeley and Betsill, 2003).

Struggles over institutional transition

Second, the transition in environmental governance in Hong Kong has proved to be an uphill struggle. Administrative measures dominate, with market-based instruments for

GHG mitigation playing a surprisingly limited role in one of the world's leading liberal market economies (Lo, 2008; Mah and Hills, 2016). Local scholars argue that Hong Kong's environmental policy institutions lack a transformative impulse (Hills, 2004). Although it is moving slowly away from the traditional command-and-control paradigm, the SAR's policy system has yet to take further steps towards potentially more feasible and effective approaches.

For the past three decades, the environmental policymaking process has been dominated by the discourse of 'administrative rationalism' (Hills, 2004), which emphasises the role of experts and recognises the importance of professional management by the state (Dryzek, 2005) (Table 1). Since 1997, post-colonial Hong Kong has shown signs of moving towards another policy approach (Hills, 2004; Hills and Welford, 2002), known as 'ecological modernisation', which emphasises the role of business and technological innovations (Dryzek, 2005; Hajer, 1995). However, the local political climate has been bleak since 2003 and even took a turn for the worse in 2014 as the quest for further democratisation encountered significant constitutional hurdles. Citizens and civil society alike have lost trust in the SAR government led by a pro-Beijing chief executive in collusion with the private sector, property developers in particular. This has severely undermined the basis for the public-private partnerships and multi-

stakeholder governance required for ecological modernisation to work (Gouldson *et al.*, 2008; Hills, 2005; Wong and Wan, 2009; Lo, 2016). Ongoing political and land-use disputes have further eroded the already low levels of trust, and the policy environment for political and business leadership continues to deteriorate.

The third problem-solving environmental policy discourse identified by Dryzek (2005) is 'economic rationalism'. This discourse privileges the use of market-based instruments, such as carbon taxes, which have proved to be political poison in many countries and regions (Harrison, 2010; Lo and Spash, 2012). The concept of emissions trading is politically more acceptable and consistent with the liberal political-economic norms of Hong Kong. However, on its own, Hong Kong can afford only a small domestic carbon market for emissions reduction trading, with a low level of market liquidity and limited marginal savings. Also, local policymakers have yet to recognise that environmental problems, notably climate change, constitute a form of market failure and that governments have a critical role to play in overcoming them (Lo, 2008; Mah and Hills, 2016). The expected transition towards a market-based approach has stagnated. In the absence of better alternatives, Hong Kong's climate change institutions have shown a regrettable tendency towards returning to a 'sectoral and technological approach' (Francesch-Huidobro, 2012, p. 801), which is rather centralised and expert-led,

Table 1. Components of three environmental discourses

Component	Administrative rationalism	Economic rationalism	Ecological modernisation
Basic entities recognised or constructed	<ul style="list-style-type: none"> ● Liberal capitalism ● Administrative state ● Experts ● Managers 	<ul style="list-style-type: none"> ● <i>Homo economicus</i> ● Markets ● Prices ● Property ● Governments (not citizens) 	<ul style="list-style-type: none"> ● Complex systems ● Nature as waste treatment plant ● Capitalist economy ● The state
Assumptions about natural relationships	<ul style="list-style-type: none"> ● Nature subordinate to human problem solving ● People subordinate to state ● Experts and managers control state. 	<ul style="list-style-type: none"> ● Competition ● Hierarchy based on expertise ● Subordination of nature 	<ul style="list-style-type: none"> ● Partnership encompassing government, business, environmentalists and scientists ● Subordination of nature ● Environmental protection and economic prosperity go together.
Agents and their motives	<ul style="list-style-type: none"> ● Experts and managers ● Motivated by public interest, defined in unitary terms 	<ul style="list-style-type: none"> ● <i>Homo economicus</i>: self-interested ● Some government officials must be motivated by public interest. 	<ul style="list-style-type: none"> ● Partners; motivated by public good

Source: Adapted from Dryzek (2005).

involving a limited range of sectors and actors, that is, administrative rationalism. Prospects for institutional transformation remain uncertain.

Local climate change governance stands at the forefront of a deadlock, lacking incentives to pursue more aggressive emissions reduction targets and explore an alternative policy approach. Transformative forces may potentially come from Mainland China, but considerable uncertainties are associated with these transformative forces.

Emissions trading in China: An opportunity or a challenge for Hong Kong?

Opportunities

The special constitutional arrangements and institutional demarcation between the 'two systems' provide more challenges than opportunities for Hong Kong to leverage its efforts on GHG mitigation. Hong Kong could benefit from the economies of scale offered by the Mainland ETS. Leung *et al.* (2009, p. 100), for example, suggest that implementing a regional ETS in the Pearl River Delta region is 'of paramount importance for Hong Kong, as well as other cities within the Pearl River Delta region'. Emissions trading may be politically feasible because it can be coordinated and operated by the private sector and non-governmental organisations and does not necessarily require new legislation or amendments to existing laws.

Crucially, voluntary participation by corporations and the public sector in emissions trading has achieved some success in developed economies (Bayon *et al.*, 2009). A voluntary scheme in Hong Kong with formal links to the domestic carbon markets in Mainland China appears to be promising. Larger markets open up more possibilities for securing access to cheaper goods and services. China's vast carbon market would give Hong Kong-based firms greater access to lower cost opportunities for GHG reduction. Acquiring cheaper emissions allowances or carbon offsets would offer them alternative (less costly) ways of meeting reduction requirements and/or fulfilling their corporate social responsibility obligations.

An additional potential benefit for Hong Kong in officially participating in nationwide carbon trading will be greater momentum for institutional

transformation driven by the powerful state machinery. The Chinese authorities have strong incentives to build capacity for local market institutions and ensure the functioning of those institutions for the delivery of environmental and economic benefits. Also, a functioning carbon market will attract large corporations and financial institutions to advocate tighter GHG control standards and the continuation of market mechanisms to protect their vested interests. The Hong Kong SAR government may be motivated to accelerate its transition towards a new environmental discourse that respects market principles and offers business opportunities. Such a weak form of sustainability policy approach may fit more easily with the prevailing ethos in Hong Kong (Hills, 2004).

Challenges

That being said, markets do not offer a perfect solution to environmental degradation. China is exposed to many market imperfections as it retains an authoritarian political regime. The fact that China is a developing market economy set up by an authoritarian regime calls into question the capacity of its market and regulatory institutions. The severely distorted state-market relations make the economic promise of carbon trading doubtful.

Enduring problems include an incomplete regulatory system, poor law enforcement, excessive state intervention and weak corporate awareness (Tao and Mah, 2009). Specifically with respect to carbon trading, these problems are exacerbated by a lack of reliable data on firms' GHG emissions, government restrictions on trading options and the lack of financial institution involvement (Lo and Yu, 2015; Shen, 2015; Zhao *et al.*, 2016; Liu *et al.*, 2015). These limitations are also well recognised by local observers, such as Martin Adams, a Hong Kong-based editor at *The Economist* magazine (Adams, 2013), and practitioners, such as the *Environomist* (2016), a Beijing-based carbon consulting firm. The functioning of these ETS is therefore questionable. As the conditions for establishing a large carbon market in China remain undeveloped, building linkages with the Chinese ETSs at the present time might not be an effective option for Hong Kong to achieve its climate change objectives. Hong Kong should

consider participation in emissions trading in China after a few years of successful operation.

Also, companies in Hong Kong have low incentives for engaging in emissions trading. The Hong Kong economy is predominantly service-based; 92.9% of its GDP is derived from the tertiary sector, whereas the primary and secondary sectors combined account for 7.1% only (Census and Statistics Department, 2015). The service industry is a low GHG emitter. Because ETSs usually involve organisations (mainly enterprises) rather than individuals, demand in Hong Kong for emissions allowances or credits from Mainland China is weak. Renewable energy is the main source of emissions credits, which are produced in one place and can be used as an 'offset' for GHG emissions produced elsewhere. With limited supply of renewable energy, Hong Kong cannot play a key role in the carbon offset market in China. Although some Hong Kong-based enterprises have developed strategies for mitigating their impacts on the climate in order to fulfil their corporate social responsibility, the majority of them remain inactive (Chu and Schroeder, 2010). The two local power companies that account for the largest share of GHG emissions in Hong Kong are relatively active in developing renewable energy and should be required to curb emissions. Apart from them, however, there are few potential trading entities within Hong Kong that have adequate demand and capacity for emissions trading. Therefore, Hong Kong is unlikely to be a critical element of the national system and to make a significant contribution to national efforts. Direct benefits for Hong Kong are likely to be limited.

Furthermore, the regulatory practice in Hong Kong is very different from Mainland China's. Binding emissions targets, which are crucial for a 'cap-and-trade' system to operate effectively, will not be automatically extended to Hong Kong, if the 'one country, two systems' principle is adhered to. Under an ETS, emissions allowances issued by a regulatory body, and the emissions credits accepted by it, are seen as a form of property rights that can be transferred between companies. As these allowances require a legal basis to establish (except those issued by industry-led governing bodies and amenable to voluntary commitments) and treated as a financial asset, remarkable differences in legal system and financial regulation might create difficulties in the formal acceptance

and transfer of allowances between Hong Kong and Mainland China. New regulations and laws would have to be established in Hong Kong to enforce emissions targets and/or recognise emissions allowances and credits from outside the territory. Such an integrating strategy involving legislation and cross-boundary governance would be politically insensitive because of the deteriorating political climate in Hong Kong and the popular hostility towards the China's intervention into Hong Kong's affairs. Only a voluntary scheme that is set up and operated by the private sector, or in the form of a public-private partnership, instead of the government, could dispense with these regulatory hurdles.

Conclusions

In this paper, we have identified the main challenges to climate change governance in Hong Kong and discussed the key issues that warrant further consideration if Hong Kong is to participate in the national ETS in China. Hong Kong is at a crossroad struggling over which environmental governance approach is in its, and the world, best interest. The local government has not proposed any major institutional innovation for controlling its GHG emissions. There are signs of returning to a sectoral and technological approach to governing the environment.

Current efforts are characterised by a passive, 'light touch' form of governance that is highly dependent on national policy directions, giving it little incentive to set its own mitigation targets. The transition towards a market-based approach to governing climate change has met with substantial hurdles. Market mechanisms have received little attention in developing a city-wide climate change strategy, whereas regulatory measures continue to dominate. While regulatory tools have not provided, so far, a transformative impulse, China's national ETS seems promising in providing the necessary momentum to a market-based approach.

However, we argue that the extent to which Hong Kong could benefit from the new ETS policy programme in China is uncertain. The necessary conditions for such a market mechanism to be successfully implemented in China remain immature. The functioning of the Chinese ETSs is questionable in the near future, raising question

about early participation by Hong Kong. Also, direct benefits for Hong Kong are likely to be limited due to its economic structure and weak demand for emissions reductions. There are regulatory barriers to enforcing emissions targets and/or recognising emissions allowances and credits from China. Cross-boundary cooperation and policy integration is an appealing concept, but the regulatory and policy framework for emissions trading in China remains incomplete and fragile and the economic and regulatory conditions in Hong Kong do not favour an active involvement at the present time. The national policy initiative will provide more challenges than opportunities for Hong Kong to leverage its efforts on GHG mitigation.

While a government-led, mandatory 'cap-and-trade' system is currently not an option for Hong Kong, voluntary emissions trading may be a feasible alternative. Voluntary systems offer greater flexibility to businesses, while being compatible with the liberal political-economic norms in Hong Kong. The model adopted by the Chicago Climate Exchange is worth considering. A group of large corporations and other organisations (e.g. government agencies, educational institutions and trade unions) that elect to pursue binding emissions reduction targets would need to agree, on a voluntary basis, on a set of rules and standards that regulate their emissions and the trading of emissions reductions within the group. They should be allowed to acquire registered emissions reductions from Mainland China to benefit from the large reservoir of emissions credits that will be brought to the market upon commencement of the national ETS (Lo and Cong, 2017), which can significantly increase market demand for these credits. The Hong Kong SAR government would need to introduce new policy measures and guidelines to regulate the use of emissions credits from China for offsetting GHG emissions from Hong Kong. It should also offer technical assistance in setting up a GHG registry and a comprehensive set of protocols for monitoring, measuring and verifying emissions reductions. Business leaders and chambers of commerce should promote the concept and build up a system for voluntary emissions trading for coordinating the currently fragmented efforts in making use of carbon offsets by individual business and organisations. Corporate engagement, therefore, will be crucial

for advancing the governance of climate change in Hong Kong.

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Note

- 1 Leung *et al.*'s (2009) statement mainly refers to regional air pollution (i.e. SO₂, NO_x, respirable suspended particulate and volatile organic compounds), instead of climate change, but these authors appear positive towards setting up an ETS for controlling CO₂.

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