



UK EMISSIONS POLICY OPTIONS

**A paper produced by Liz Bossley, Consilience
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A. Introduction

1. This report has been written by Liz Bossley the CEO of the Consilience Energy Advisory Group Ltd ('CEAG') at the request of the Economic Development Office of the City of London ('CoL'). It builds on the CoL report 'Emissions Trading and the City of London' from September 2006¹, authored by CEAG.
2. The purpose of the report is to inform the input of CoL's representatives to a range of high level studies that aim to ensure that London maintains its place as a world leading financial services centre. It sets the context and describes the opportunities for London arising from market developments in emissions trading and the related emerging climate markets.
3. The report has been tested on a range of emissions industry practitioners and has gained broad approval in roundtable discussions². It is intended by CoL that this roundtable will form the embryo from which an inclusive stakeholder forum will grow to develop the ideas contained in the report and to respond to the evolving climate change negotiations.
4. The report will :
 - a. Briefly summarise the current stage of development of the international Kyoto-based emissions market, the mandatory regional and national markets around the world and the international voluntary market;
 - b. Assess the contribution of the different asset classes of allowances that are trading in the market, their relative values and how they are linked;
 - c. Explain the transaction log and registry system that controls the international transfer of emissions allowances and propose a method whereby the UK registry can be adapted to overcome the limitations of this system to facilitate international trade conducted through the UK;
 - d. Consider the range of likely outcomes of the negotiations on a new Kyoto deal post-2012 and the UK's role in these discussions;

¹ To download a pdf of 'Emissions Trading and the City of London' see the archived reports section of the publications at <http://www.cityoflondon.gov.uk/economicresearch>

² Thanks are given to Andrew Kerr of E3, Gavin Templeton of Rabobank, Wanda Kim of UBS, Bill Sneyd of Carbon Neutral, Louis Redshaw of Barclays Capital, Greg Dunne of Icecap, Chris Norton and Angela Mouton of Lovells and Miles Austin of Ecosecurities for their input.

- e. Suggest a framework whereby complementary policies of the Greater London Authority and the City of London can be coordinated with UK national climate change policy:
- i. to maintain and enhance London's role as a centre of innovation in the emissions trade;
 - ii. to take advantage of economies of scale in compliance;
 - iii. to assure that clear and consistent price signals are given throughout the economy; and,
 - iv. to ensure that London is at the forefront of development of new financial products in the national and international emissions markets.

B. Executive Summary

5. Trading in the international Kyoto emissions market is underway and it is anticipated to be the fastest growing new market in the world. The allowance generated by the Kyoto Clean Development Mechanism, the Certified Emissions reduction ('CER'), is emerging as the front-runner to be the 'benchmark' allowance, akin to a dollar standard, against which all other asset classes of allowances will be valued. This role has grown over the last three years as almost 200 million CERs have been issued and as an increasing number of national and regional trading schemes have announced that they will accept the CER as a compliance instrument.
6. The European Emissions Trading Scheme ('EU ETS') is the most actively traded scheme at the moment, but national and regional schemes are emerging:
 - a. In other countries that have accepted Kyoto limits, or caps, on their future emissions;
 - b. In countries that have not yet accepted Kyoto caps; and,
 - c. In the voluntary sector.

Each scheme recognises the CER as one of its compliance instruments.

7. The burgeoning voluntary sector provides a strong signal to the next evolutionary step in the market - the rise of the retail sector. Currently small companies, households and individuals have limited access to the Kyoto and EU ETS markets partly because of the large typical transaction size, but also because of the financial and administrative barriers to entry to the market. This demand is being filled instead by the voluntary sector where small buyers are offered the opportunity to offset their carbon footprint, or the footprint of the goods and services they are purchasing, by buying a Verified Emissions Reduction ('VER') allowance. As the appetite for voluntary offsets grows it is likely to be re-enforced by mandatory demand for smaller sized allowance transactions as the concept of cap-and-trade is taken up by regional and local authorities who wish to align their own environmental policies with those of national governments and the international climate change mitigation effort. This will require further development of the international emissions allowance transfer infrastructure, which the UK has the capacity to pioneer.
8. The allowance transfer infrastructure - transaction logs and registries - inhibits the free transfer of allowances amongst mandatory schemes and the voluntary sector. The UK registry could be developed to provide international transaction transfer services, analogous to the services provided by the Bank for International Settlements or SWIFT. Whether or not the EC review of Phase 3 succeeds in merging all 27 European registries into one central registry, as is currently proposed, it is recommended by the report that the UK registry gives urgent consideration to the development of a UK 'meta-registry' capable of

- handling transactions in all allowances from all emissions trading schemes and projects. The purpose of this development would be to attract to the UK the associated jobs and fees.
9. Negotiations to agree a new deal to take effect from 2013 are underway with a view to its announcement in Copenhagen in December 2009. Talks are focussing on inducing the USA, China and India to accept meaningful emissions caps from that date. This is the preferred outcome.
 - a. If these countries will only accept caps that are so high that they risk perpetuating or exacerbating the current surplus of Kyoto allowances available, this could undermine the international carbon price and any green investment incentive. It may be preferable to leave them out of the deal altogether than accept this outcome.
 - b. An alternative solution might be to propose that the large developing countries accept a quota of CDM projects, rather than a cap on their emissions. If a developing country were to fail to fill its CDM quota domestically it would have the option of buying the shortfall of CER allowances in the international secondary market. This suggests an approach that limits carbon intensity rather than limiting absolute emissions and to that extent is recognised to be arguably less than ideal. However, it may provide a pragmatic compromise in the face of the intractable ideological stances of the USA and the major developing economies.
 - c. If the Copenhagen talks collapse, then a fallback position might be the continuation of the CDM project mechanism and the promotion of separate national cap-and-trade schemes with caps set by national governments, but linked by a common compliance instrument, the CER.
 10. Under any scenario the CDM project mechanism needs improvement to eliminate the bottlenecks that practitioners advise are delaying the implementation of valid projects. There are currently 89 projects on hold awaiting registration by the CDM Executive Board. As a practical and manageable first step the City supports the rapid training and accreditation of UK based Designated Operational Entities to support UK companies seeking to register projects.
 11. The City of London is hailed as the centre of the international emissions trade, based partly on the existence of a substantial and mature 'cluster' of firms operating in the emissions space in London. The claim is also based on the presence of the most successful regulated emissions futures exchange, the European Climate Exchange ('ECX'), in London. Several cities are challenging this position. The existence of the emissions cluster owes much to the pre-existence of related markets in London and its continuation depends on the commercial climate, the ready availability of support from the service sector and on social infrastructural factors. To maintain its dominance, the UK in general, and London in particular, is strongly advised to reinforce these factors and continue to promote innovation in the emissions market.

12. This report proposes that relevant future UK environmental schemes aimed at the reduction of greenhouse gases ('GHG's) at the national, regional and local level use the CER as a compliance instrument. An active policy to coordinate the use of the CER in this way would have an invaluable educational and behavioural impact throughout the economy and would provide economies of scale in compliance. It is suggested that no change would be required in the current division of responsibility for deciding on the nature of environmental policies. It would simply involve the organisation and coordination of compliance mechanics by the UK government, the Greater London Authority, other local authorities and the City of London. Tokyo and Japan are already moving in this direction and are working on a prototype scheme that coordinates compliance within the Japanese registry and involves a quasi-retail sector.
13. It is proposed by the report that if future UK GHG-based environmental policies were coordinated using the CER as a compliance tool, this would promote liquidity in the wider market and trigger a retail sector operating in London from within the UK registry, and serviced by UK licensed retailers. This would place the UK and London in a position where it could:
 - a. Attract new jobs throughout the economy;
 - b. Increase fee and tax revenue from transactions in the UK market;
 - c. Clarify investment incentives for new technologies and environmentally-friendly products based on an international carbon price; and,
 - d. Secure Britain's position as a centre of innovation in the emissions sector.

C. The Current State of Market Development

14. The UN Framework Convention on Climate Change ('UNFCCC')³ was created at the Rio Earth summit in 1992. It commits Annex 1 countries in the OECD and Commonwealth of Independent States to limit their own GHG emissions and return to levels of emissions that were in effect in an earlier historic period. The OECD, the Annex 2 countries, which are a subset of Annex 1, are further committed to pay the costs for developing countries to measure and communicate their GHG emissions, to underwrite the cost of transferring green technology to developing countries and to provide aid to vulnerable developing countries in adapting to climate change. Non-Annex 1 countries, a disparate group of developing nations, including countries as different as China, Nigeria, Saudi Arabia and Cyprus, made no specific commitments to do other than cooperate with the process, particularly by assisting in the monitoring and measuring of GHG emissions.
15. The Kyoto Protocol⁴ was devised at the third Conference of Parties ('COP') to the UNFCCC in 1997 to put flesh on the bones of the UNFCCC commitments. The protocol is a cap-and-trade scheme. By ratifying the protocol, 37 developed, or so-called 'Annex B',⁵ countries have committed to cap their GHG emissions at, on average, 5.2% below their 1990 levels during the five year period 2008-2012. The USA has signed and is still bound by the terms of the UNFCCC, even though it has not ratified the Kyoto Protocol.
16. Having set a limit ('cap') on the permitted emissions level during 2008-2012 at a percentage of 1990, the body of the UNFCCC then granted free permits to emit GHGs, called Assigned Amount Units ('AAUs'), to each country equivalent to its percentage reduction cap expressed in tonnes of CO₂ equivalent ('tCO₂e'). At the end of the first commitment period each country must surrender back to the UNFCCC enough AAUs to cover its actual emissions during 2008-2012, the latter of which may be greater or less than its cap.

³ <http://unfccc.int/2860.php>

⁴ http://unfccc.int/kyoto_protocol/items/2830.php

⁵ Annex 1 is UNFCCC terminology. Annex B is Kyoto Protocol terminology but the two terms tend to be used inter-changeably. All Annex B countries are Annex 1 countries. Not all Annex 1 countries are Annex B countries.

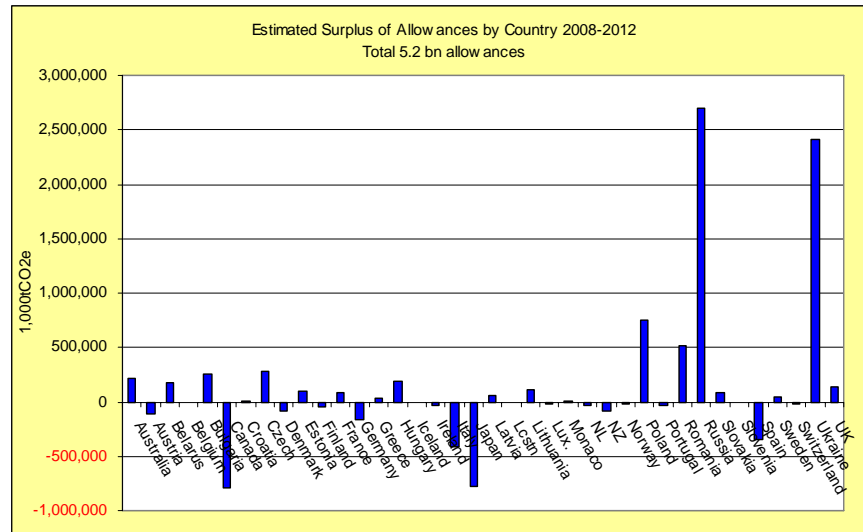
Government to Government Cap-and-Trade

17. In theory, if a country continued to grow but took no steps to reduce its associated emissions, it would be short of allowances, because business-as-usual emissions would exceed the capped level. Faced with a shortage of allowances the countries concerned must then:
 - Cut production of goods and services to reduce their emissions; or,
 - Invest in clean technology at home or abroad, the latter using the Clean Development Mechanism or Joint Implementation project mechanisms, to reduce their emissions per unit of output; or,
 - Buy in the market sufficient AAUs to cover its shortfall of allowances compared with its cap. This is where the 'trade' part of cap-and-trade comes in.
18. The overseas investment option promotes least cost compliance. The capped Kyoto Annex B countries can invest in clean technology projects in developing countries that are not subject to a Kyoto cap, the so-called non-Annex 1 countries. This investment is rewarded with additional allowances, which can be surrendered by the Annex B country to meet its domestic cap. This is the Clean Development Mechanism ('CDM') and the allowances produced are known as Certified Emissions Reductions ('CERs').
19. Alternatively the capped Kyoto Annex B countries can invest in clean technology projects in another capped Annex B country. In that case the investor is rewarded by the project host, which converts some of its AAUs into Emissions Reduction Units ('ERUs') that can also be surrendered by the investing Annex B country to meet its domestic cap. This mechanism is referred to as Joint Implementation ('JI').
20. Both CDM and JI projects are carried out by companies rather than countries, but participants require the approval of the Designated National Authorities ('DNAs') of the host and investing countries to proceed. In practice the CDM mechanism has been considerably more successful than JI: over 1,000 CDM projects have been registered by companies and more than 165 million CERs have been issued. No ERUs have been issued so far, but several projects have now been registered with the Joint Implementation Supervisory Committee ('JISC') and a pipeline of ERUs is now in prospect.
21. Countries that are short of allowances because their Kyoto cap is below 2008-2012 forecast emissions are unlikely to voluntarily cut production to contain emissions, so the decision is one of whether to invest in cleaner technology or buy AAUs from a country that can cut its actual emissions more easily or cheaply than the country facing the shortage.
22. Which of these options is chosen depends on the price of AAUs. The higher the AAU price, the more that investment in clean technology will prove economically viable.
23. In practice, the total number of AAUs granted by the UNFCCC is much greater than the likely level of actual emissions during 2008-2012. Based on

the reports of the 37 countries of their actual emissions in 2005, the latest year for which consistent data for all countries has been reported, there will be about 5.2 billion AAUs surplus out of a total of the 61 billion AAUs likely to be granted during the first commitment period i.e. the Kyoto market is 9% long. (See Figure 1).

24. This is before taking into account an additional 2.4 billion CER allowances, recently reduced from 2.7 billion, forecast to be created to reward overseas CDM projects in developing countries during 2005-2012, taking the surplus to about 12-13%.
25. Economic growth in the 37 countries between 2005 and the end of 2012 is likely to eat up some of this surplus. Nevertheless it is improbable that the price of AAUs will be high enough to make many investment alternatives, such as clean coal or carbon capture and storage, look attractive.
26. There are two factors moderating this downward price pressure. Countries with a surplus of AAUs in 2008-2012, mainly the FSU states with Russia and the Ukraine standing out as the biggest 'longs' by far, can carry them forward into the second Kyoto commitment period to be used to cover larger emissions resulting from future economic growth. Furthermore the countries that are short, mainly Japan and Canada, have said that they will not buy surplus AAUs from the FSU because they have been generated by the economic collapse since 1990 when the USSR broke up, rather than by a conscious effort to clean up emissions.

Figure 1: Estimated Surplus of Allowances by Country 2008-2012



27. Whether Russia and the Ukraine will dump the AAU surplus in the market or carry it forward for future use depends on whether or not there will be a second Kyoto commitment period post 2012. This will be discussed in detail later in the report in Section E.

International Cap-and-Trade Schemes

28. While responsibility for compliance with the Kyoto Protocol rests on the shoulders of governments, most of these 37 countries are choosing to delegate to industry through national or regional emissions trading schemes the responsibility for the decision of whether or not to buy allowances or invest in clean technology. These schemes involve:
 - Annex B countries that have Kyoto caps;
 - The USA, which has no Kyoto cap, but still has UNFCCC obligations to meet;
 - Non-Annex 1 countries that do not have Kyoto caps, but who nonetheless are choosing to impose their own nationally controlled caps on domestic industry and other sectors; and,
 - Taiwan, which is not a member of the UN and therefore not a UNFCCC signatory, but which wants to make its own contribution to the climate change mitigation effort.
29. Each of these schemes begins as a stand-alone instrument of national policy on climate change. Each trading scheme so far has created a new allowance that can be used by firms that are subject to the national scheme for compliance purposes.
30. Governments may choose to comply jointly with any commitments they have made under the Kyoto Protocol and behave as if the combined governments' commitments are one commitment under Kyoto. Europe is so far the only example of a region that has opted to comply jointly under the terms of the European Emissions Directive. The compliance instrument for the 27 EU countries that are subject to the EU ETS is the European allowance, or 'EUA'.
31. Alternatively countries or regions can agree to link their emissions trading schemes and, while still complying with the Kyoto Protocol separately, each will accept the others allowances for compliance with national or regional schemes. For example, the European Economic Area is in the process of linking to the EU ETS. The mechanism to achieve this linkage is the incorporation of the EU ETS Directive into the European Economic Area agreement.
32. Significantly, Kyoto project based allowances, generated by CDM or JI projects, are accepted as a compliance instrument by the majority of international, regional and domestic emissions trading schemes. This makes the CDM CER and the JI ERU the most fungible, i.e. interchangeable, international compliance currencies.
33. Figure 2 shows the national and regional emissions trading schemes that are already operating or are planned for the near future. Further details are contained in Appendix 2.
34. Table 1 describes the class of allowances that can be used as a compliance instrument in each scheme, based on current knowledge of a rapidly evolving situation.

Figure 2: National and Regional Emissions Trading Schemes Operating / Planned for Near Future

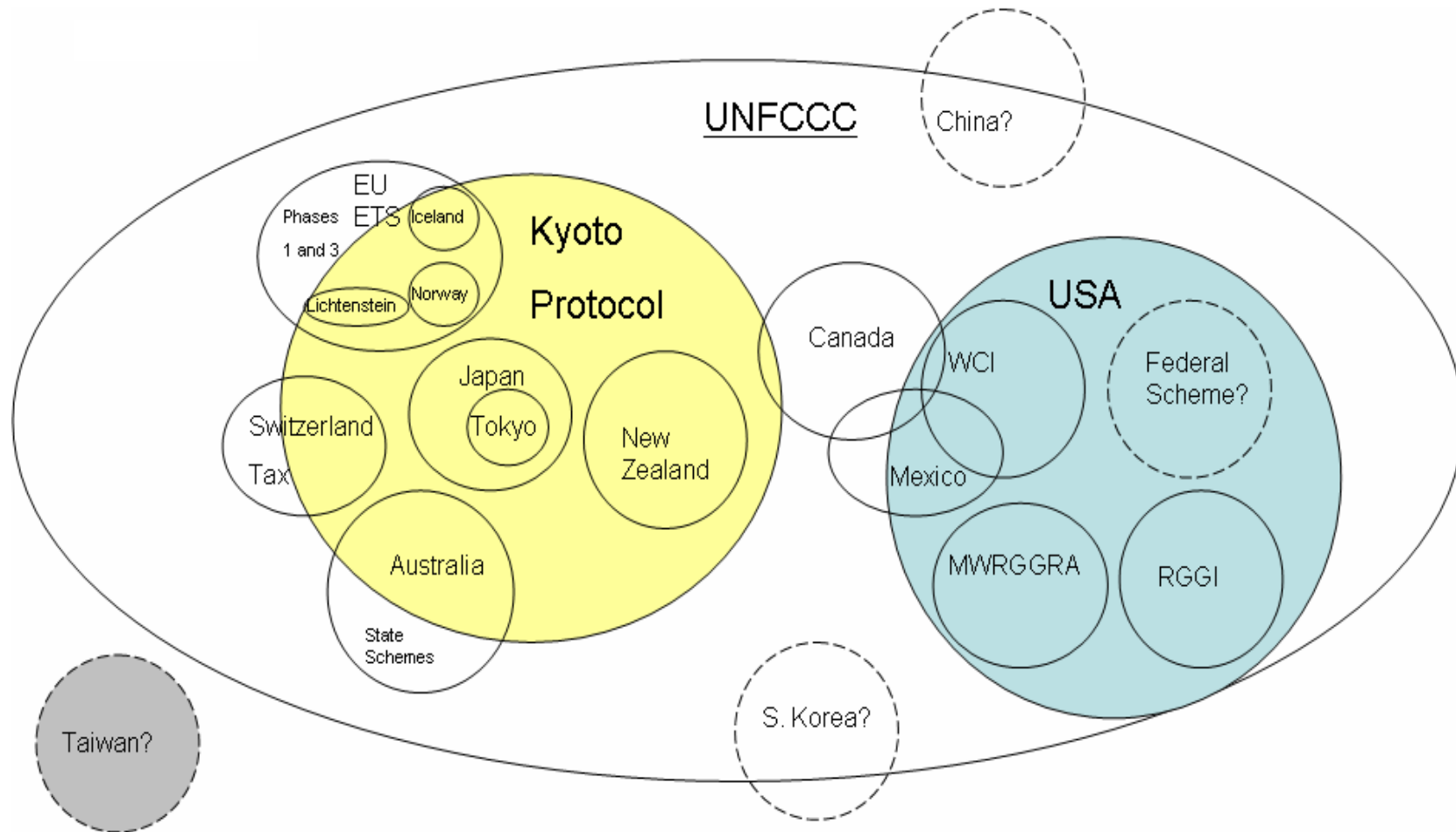


Table 1: Compliant Allowances for Each Scheme

Compliant Allowances	Aus.	Canada	China	Europe and EEA	Japan	Tokyo	NZ	S. Korea	Switz.	Taiwan	US Federal	RGGI	WCI	MWRGGRA
AAUs							*?							
CERs	*	*		*	*	?	*		*			*		
ERUs	*			*	*	?	*		*			*		
RMUs	*						*							
Australian ('AEUs')	*						*							
Canadian		*												
Chinese			*?											
European ('EUAs')				*			*							
Japanese ('JPAs')					*	*?								
New Zealand ('NZUs')							*							
Taiwan										*?				
S. Korea								*?						
Swiss							*		*					
Taiwan										*?				
US Federal											?			
RGAs												*	*?	
WCI												*?	*	
MWRGGRA												*?	*?	*
VERs	Domestic		?		Domestic			?		?		RRGI	WCI	

Mandatory Regional and National Schemes

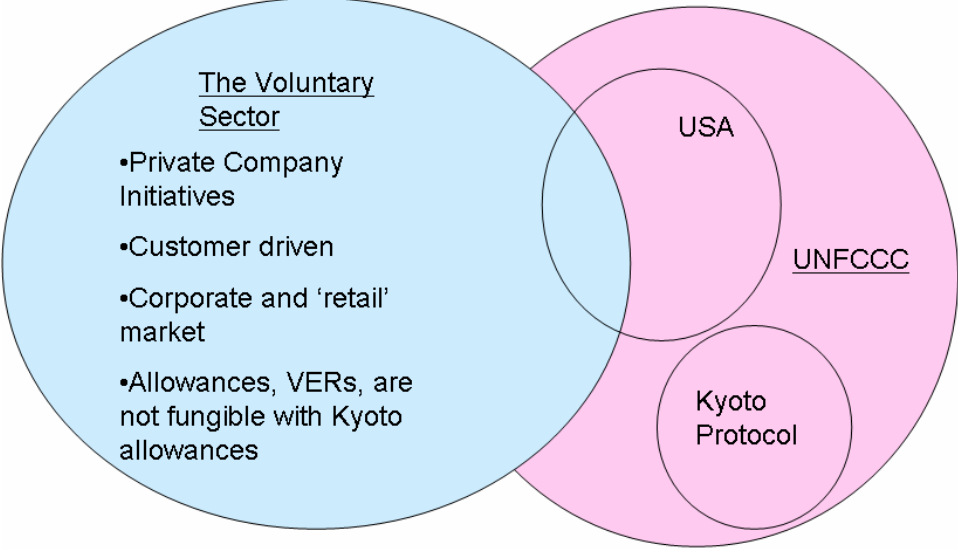
35. The first scheme to commence operation was the **European Emissions Trading Scheme** ('EU ETS'), which started in 2005 to prepare for the first Kyoto commitment period. The EU ETS allows Kyoto CERs, and the less well-developed Kyoto Joint Implementation project allowance, the ERU, to be used in compliance with the regional scheme.
36. **Australia** is introducing its Carbon Pollution Reduction Scheme in mid-2010. This will recognize Australian national allowances and Kyoto CERs, ERUs and RMUs, the last of which refers to Kyoto allowances issued to carbon sinks or sequestration projects.
37. **Canada's** scheme recognizes compliance through a simple payment into a technology fund or by surrendering Canadian allowances and Kyoto CERs.
38. **Japan** envisages a scheme to be introduced later this year which accepts Japanese national allowances ('JPAs'), CERs and ERUs. The city of Tokyo plans an independent scheme, but has not yet announced its compliance instrument.
39. **New Zealand** has a scheme that starts trading in January 2010. It was initially envisaged that almost all allowances from all emissions trading systems could be used in compliance, but in second draft is narrowing down to NZ national allowances and the Kyoto compliance instruments i.e. 'greened' ⁶AAUs, CERs, ERUS and RMUs.
40. **Switzerland** introduced a trading scheme at the beginning of 2008, which has a tax payment alternative, but which allows companies to comply by surrendering Kyoto CERs and ERUs.
41. After rejecting the Lieberman Warner bill in June 2008, the **USA** continues to work on a Federal scheme, the latest bill for which, the Boucher Dingell Bill, was introduced in the House of Representatives on 7th October 2008. The bill seeks an emissions reduction of 6 per cent below 2005 levels by 2020, escalating to a 44 per cent cut from the same levels ten years later. It is hoped that some form of the bill will be passed in 2010. In the meantime the first allowance auction for the Regional Greenhouse Gas Initiative ('RGGI') will take place on 25th September 2008. This scheme will allow the use of CERs and ERUs, but only if the RGGI price exceeds \$10/ton. Compliance instruments for other US regional schemes, the Mid-Western Regional Green House Gas Reduction Accord ('MWRGGRA') and the Western Climate Initiative ('WCI') have not yet been specified. Some Mexican and Canadian regions have signed up to link to the WCI.
42. **China, South Korea and Taiwan**, the last of which is not a UN member and therefore is not capable of signing the Kyoto Protocol, are each planning domestic emissions trading schemes, but have given no clue as to whether they will create new domestic allowances or use Kyoto allowances such as AAUs, CERs or ERUs. If they did, then they would forge a fungibility link amongst all Kyoto and non-Kyoto schemes.

⁶ Greened AAUs are surplus AAUs that have been granted to Annex B countries such as Russia and Ukraine, but have not involved active steps to reduce their emissions. Most governments will not by such 'hot air' unless they are converted to ERUs through a JI project or the revenue from the sale is hypothecated to an environmental project.

The Voluntary Sector

43. The voluntary sector exists outside the scope of Kyoto and most regional and national emissions trading schemes, (see Figure 3). This sector is the closest we currently have to a retail emissions sector and it gives powerful signals about how this sector may develop. In CEAG's opinion, the city that picks up these signals and translates them into a local policy that promotes a retail emissions market has a good chance of winning the prize of being the international centre of emissions trading.
44. The voluntary sector fills a gap in the Kyoto project market. It is comprised of:
 - a. Projects in non-Kyoto countries, e.g. US, Taiwan, CDM-type projects that do not meet Kyoto eligibility criteria;
 - b. JI-type projects in Annex B countries that do not want to convert their AAUs to ERUs, e.g. the UK;
 - c. Small scale projects that cannot justify Kyoto administrative cost; and,
 - d. Projects in sectors not covered by the Kyoto Protocol, e.g. aviation or the domestic sector.
45. Companies enter into voluntary projects or buy the allowances created by such projects for various reasons: because of customer, investor or staff pressure on the company to demonstrate its carbon neutrality; to make savings on energy use and thereby lower costs; to differentiate their products from those of their competitors; and, in some cases, to anticipate future regulation and assist in early implementation of a carbon management strategy.
46. The voluntary sector is also the only way that most households or members of the public can get involved in the climate mitigation effort. The majority of individuals are not sufficiently wealthy or sophisticated to open up an account in a registry, but will often agree to pay a bit more for goods and services if they can claim to be carbon neutral. For example, a passenger may pay extra for a seat on a plane if they are assured that the carbon created by their journey is being offset by a carbon saving elsewhere, which their extra payment will underwrite. The airline buys *and cancels* a Verified Emissions Reduction ('VER') on their behalf. The passenger must be assured that the carbon saving project that generated the VER would not have happened without their extra payment being used to underwrite the cost of investment.
47. VERs cannot be used by Annex B countries to comply with their Kyoto commitments, that is, VERs cannot be surrendered to the UNFCCC as a qualifying allowance to meet a developed country's Kyoto cap. That does not mean to say that the carbon savings they represent are any less real. To reinforce the credentials of VERs, reputable companies involved in the voluntary sector usually have their projects independently verified by third parties to corroborate that the carbon savings they claim are real and that the savings are 'additional', i.e. the project would not have happened anyway absent the funding provided by the sale of VERs. There are a range of internationally recognised verification standards in operation that spell out the methodology for verification of VERs.

Figure 3: The Scope of the Voluntary Sector



D. The Importance of Registries for UK Policy Options

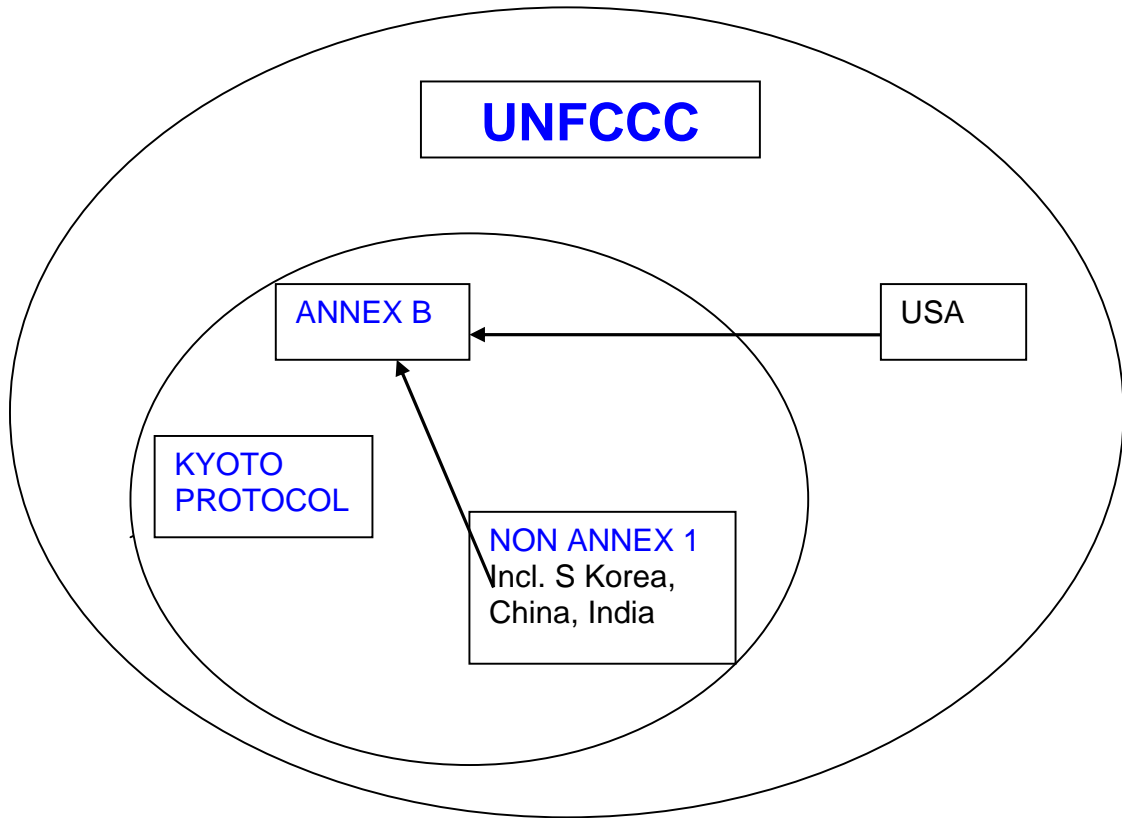
48. The international emissions allowance transfer infrastructure is comprised of the UNFCCC Independent Transaction Log ('ITL'), the European Community Independent Transaction Log ('CITL'), the national registries of the 27 European Member States and the registries of the other 10 or so countries that are subject to Kyoto caps. The mechanical operation of this infrastructure is described in Appendix 1.
49. The review of the EU ETS currently underway proposes that from Phase 3 of the EU ETS (2013-2020) allowances will be held in one European Community registry instead of in 27 national registries.
50. The transaction log and registry system are analogous to the international banking system. The national registries that hold individual allowances created by Annex B country or regional schemes are like national banks. Anyone can open up an account in any bank (subject to the usual identity and anti-money laundering checks). The bank may permit the holding of accounts only in the national currency or may permit the holding of accounts for the transfer of foreign currencies. For a multinational organisation involved in international trade the facility to hold consolidated funds in a range of different currency denominations in one bank is a useful one. This is also the case for multinational organisations that must comply with, or choose to trade in, a range of national emissions trading schemes worldwide.
51. The transaction logs are loosely analogous to the Bank for International Settlements or the Society for Worldwide Interbank Financial Telecommunication ('SWIFT'), which facilitate transfers of a wide range of financial products around the world.
52. As the number of emissions 'currencies' proliferate around the world, and as national emissions trading schemes evolve potentially into the retail sector, the demand for emissions 'banking', i.e. registry, services will grow. London would be ideally placed to service this need through a development of the UK national registry. The UK registry software could be developed to accommodate transfers of all forms of Kyoto, regional, national and voluntary allowances. The vast majority of intercompany commercial transactions do not require ITL/CITL approval. So a 'bank' or registry that allows such inter-account transfers would be a boon.
53. Whether or not the EC review of Phase 3 succeeds in merging all 27 European registries into one central registry, it is recommended that the UK develops a UK-based 'Meta-registry' that recognises and accommodates the transfer of all the different emissions currencies that are emerging around the world. The development of an inter-account allowance or permit transfer service would attract jobs and fees to the UK. It is likely that other cities, governments or commercial entities have identified this opportunity and may only be a matter of time before this service is offered elsewhere. It is strongly recommended that a working group, involving the Department for Energy and Climate Change ('DECC') and the UK registry team, be convened at the earliest opportunity.

54. Competition to provide this service is likely to include the Swiss registry. Switzerland has been very quick to capitalise on Europe's embarrassment over the delay to linking the CITL and ITL, which was promised in 2007, but has now been delayed until, on latest advice, 16th October 2008. For example, CDM project participants who have been unable to take delivery of CERs into European registries while the link has been repeatedly postponed have instead opened up accounts mainly in the Swiss registry, but in some cases in the Japanese and New Zealand registries. This has negated some of the early mover advantage enjoyed by the UK as operator of the first European registry which was constructed to service the 2002 UK emissions trading scheme.

E. A Deal for Post 2012- the Road to Copenhagen

55. While the first commitment period of the Kyoto Protocol (2008-2012) has only just commenced, international attention is already focussed on how the climate change mitigation effort will continue into 2013 and beyond.
56. The stated objective of the Conference of Parties of the UNFCCC at its meeting in Bali, COP 13, in December 2007 is to have a new deal in place by COP 15 in Copenhagen in December 2009. (See Figure 4).
57. Negotiating positions are polarizing around the need to induce the USA, China, and India, and to a lesser extent Brazil, Mexico and South Korea, to become Annex 1 countries, that is, to accept caps on emissions set by the UNFCCC, in the post 2012 period. These are the largest and/or the fastest growing emitters in the world. The USA is adamant that it will not accept a UNFCCC cap unless the developing nations do likewise. China and India are equally adamant that economic growth and poverty eradication are their first priorities and they will not accept Kyoto caps.
58. Countries who already have caps, particularly Canada, Japan and Australia, are expressing doubts about whether or not they want to renew or reduce them, especially without the cooperation of the big three- the USA, China and India.
59. Canada, Japan and Australia have the option of withdrawing from the Kyoto Protocol after 3 years if they so choose. The UK's negotiating stance will depend on its political view of the preferred outcome, but it may also be influenced by its assessment of the realism of expecting a negotiated settlement.

Figure 4: A Deal for Post 2012



Agreement with High Caps

60. In deciding its stance, government may wish to bear in mind that, since the negotiation of Kyoto caps is a complex process involving many ancillary issues and resulting in pragmatic compromises, any final agreement is likely to tend towards the allocation of surplus allowances. This is because we stand the best chance of winning the agreement of the USA, China and India to Annex B capped status if their caps are set so high that they will not inhibit their economic growth or competitive position in international trade. While this pressure will undoubtedly be resisted, the tendency towards surplus is a real risk.
61. If these countries acquire a surplus of AAUs to add to the substantial surplus already in the hands of Russia and the other FSU states, there will be persistent downward pressure on the price of allowances. A low carbon price will remove the green investment incentive of all countries, not just the countries in surplus. This outcome would arguably be worse than no agreement at all.

A CDM Quota Alternative

62. If, in the opinion of the UK government, there is little chance of achieving a meaningful agreement in Copenhagen, an alternative might be to propose that the large developing countries accept a quota of CDM projects, rather than a cap on their emissions. If a country were to fail to fill its quota domestically it would have the option of buying the shortfall of CER allowances in the international secondary market.
63. Such a quota system has a benefit in that it could not be mistaken for a limitation on economic growth, but by placing an obligation on developing countries to buy CERs if they do not meet their quota, it would provide some reassurance that every unit of investment in the developing nations would be tested for its environmental integrity.
64. This outcome would be controversial, not least because environmental pressure groups, rightly or wrongly, regard emissions savings in developing countries to be less worthwhile than domestic emissions savings within developed countries. The 'supplementarity' wording of the Kyoto Protocol supports this ambivalence. This report challenges that ambivalence.
65. The Intergovernmental Panel on Climate Change ('IPCC') is clear that a tonne of GHG emissions has the same global warming effect regardless of where it is emitted. The corollary of this fact is that a tonne of GHG emissions saved has the same global warming reduction effect regardless of where it is saved. The whole concept of the CDM and JI mechanism is that it makes sense to reduce GHGs first where it is easiest and cheapest to do so and this may well be in developing countries rather than developed countries. If the price of carbon is sufficiently high, all possible GHG reductions will be made in time, but the CDM and JI mechanisms encourage reductions in order of economic merit.
66. The objection to the free use of CERs and ERUs to meet the caps of Annex B countries is that these allowances represent emissions savings against a rising 'business-as-usual' baseline and not an absolute cut in current emission levels. In other words they arise from a 'baseline-and-credit' approach rather than a 'cap-and-trade' approach. To that extent they are a reduction in emissions

intensity, not in absolute emissions. This is true, but arguably irrelevant if agreement to a meaningful cap-and-trade deal cannot be reached.

67. Undoubtedly the ideal outcome would be that all countries accept low caps on their absolute emissions levels, but that presupposes a political, social and economic landscape that does not currently exist. If low absolute caps for all are not achievable, then a CDM quota may be a practical compromise.

No Agreement on any Caps Beyond 2013

68. It is difficult to envisage the circumstances that would allow the Copenhagen meeting to produce low enough emissions caps to satisfy the scientists and promote an international emissions trading scheme for all the largest emitting countries, including the USA, China, and India.
69. If the Copenhagen talks collapse with either no caps at all or only renewed caps for the existing 37 capped Annex B countries, then a fallback position might be the continuation of the CDM project mechanism and the promotion of separate national cap-and-trade schemes linked by a common compliance instrument, the CER. The cap and trade concept has taken root worldwide, as Figure 2 demonstrated. Even if no post-2012 international deal is reached by the end of 2009, it is highly likely that national emissions trading schemes will not only survive, but continue to grow.
70. The EU ETS, for example, would continue to operate, because it is now enshrined in European law. Proposals for Phase 3 of the EU ETS already anticipate a failure of the Copenhagen talks to reach an agreement that Europe deems acceptable. Two alternative emissions reduction trajectories are envisaged: 20% if no acceptable agreement is reached; or, 30% if there is. The Phase 3 deal is meeting strong resistance in the European parliament both to the absolute level of the caps and the supplementary limits i.e. many countries, including the UK, are arguing for a higher use of CERs and ERUs to meet national caps.
71. In the scenario where national schemes fill a vacuum left by non-agreement to a successor to Kyoto, countries would set their own caps for their national schemes and generate their own national allowances. Countries could still link to other compatible national schemes worldwide at their own discretion. Investors would still be able to invest in CDM projects and earn CERs and it would be up to each government to decide how many CERs it would accept in compliance with its own scheme.
72. If each of the disparate national schemes were to accept one common currency, such as the CER, at least for partial compliance with its scheme in addition to its own national allowance, then we still have the chance of establishing a common carbon price to inform international investment decisions.
73. It would be desirable to maintain the ultimate objective of fostering a single international carbon price to inform investment decisions even if the Copenhagen talks are unsuccessful. It would be of crucial importance to this objective that the CDM project mechanism survives and that national schemes recognise the CER, to provide a market for these allowances.
74. Whether or not a Kyoto Protocol-based market continues, it seems likely that some if not all of the other trading schemes mentioned above will grow and the

UK and the City of London will wish to be at the forefront of their development to capture a substantial proportion of the future business transacted.

Support for the CDM Mechanism

75. Under any scenario it is a strong recommendation of this report that the UK supports the continuation and reinforcement of the CDM mechanism to overcome some of the bottlenecks that are currently undermining its practical operation.
76. The JI mechanism could not survive a failure to agree new Annex B country caps because the mechanism itself is based on the conversion of Annex B country allowances issued under the Kyoto Protocol, AAs, to ERUs to reward project investment in developed countries or in Economies in Transition ('EIT's). If there is no post 2012 deal there will be no AAs issued to these countries, so JI as a concept would be redundant.
77. London practitioners specialising in the CDM market complain that it is being destroyed by the bureaucracy of the UNFCCC. The CDM Executive Board ('CDM EB') is currently considering 500 projects, of which 89 are still awaiting registration, and progress is so slow that it calls the viability of such projects into question. The same practitioners call for the deployment of more resources to the CDM EB, coupled with the introduction improved accountability standards to be applied to board members for their decisions.
78. A further bottleneck which the UK government and the City of London could take direct action to address is the promotion of rapid training and accreditation of Designated Operational Entities ('DOEs') in the UK, qualified to validate and verify CDM projects. Before a CDM project can be registered with the CDM EB it must be validated by an independent DOE. Before CERs are issued by the CDM EB, the actual GHG savings are subject to ongoing verification by DOEs. There are not enough DOEs worldwide to perform this role and very few in the UK. This means that CDM project participants must go overseas and join a long queue to book these services. Direct support for UK based DOEs would have significant advantages to UK CDM project participants and in attracting worldwide CDM business to the UK.
79. Finally, there are some emerging niche asset classes which will form part of the post-2012 market that could be encouraged by the City. In particular the recognition of, and provision of a market for, allowances generated by forestry projects, carbon capture and storage and voluntary projects could gain an early movers advantage for the UK. This will be discussed in Section F under the heading of 'Joined Up Policy as a Spur to Innovation.'

F. Coordinating UK, Greater London and City Policies

80. The City claims to be at the centre of the international emissions trade, based partly on the existence of a substantial and mature 'cluster' of firms operating in the emissions space from London. The claim is also partly based on the presence of the most actively traded regulated emissions futures exchange, the European Climate Exchange ('ECX'), in London.
81. The cluster gives London a powerful advantage. Since the end of the 1990s, firms have been establishing emissions services in London including lawyers, accountants, project financiers, verifiers, traders, brokers, consultants, educators and so forth. The networking opportunities for emissions related companies and the ease of finding competing service companies to support transactions is an undeniable benefit.
82. The existence of the cluster depends as much on the pre-existence of related markets, such as the Brent forward market and those markets promoted by the UK's early implementation of the European Gas and Electricity Directives, as it does to the UK's early experiment in 2002 with the UK Emissions Trading Scheme. Its continuation depends on the commercial climate, including the tax and regulatory framework, on the ready availability of support from the service sector and on infrastructural factors such as the availability of office space, the transportation network, housing, schools and so forth.
83. ECX is a highly successful exchange, which has just announced that it has doubled its trading turnover for 2007 in the first 10 months of 2008. The emissions contracts it trades are electronic and there is no trading pit in London, or elsewhere. Business is transacted from traders' desks around the world. The ECX is owned by the Climate Exchange plc, a UK AIM listed company, which maintains a small office in London. It trades on the ICE platform, which is itself owned by an Atlanta based firm.
84. While ECX remains currently the most liquid regulated contract, competing exchanges are mushrooming around the world offering a range of spot, cleared forward, futures and options contracts in Kyoto emissions allowances, in national allowances from mandatory schemes and VERs from voluntary projects. At the last count there were more than ten already in existence and more are planned.
85. A number of countries and cities are attempting to challenge London's position as the centre of emissions trading, or at least to become regional centres. Each believes that this can be achieved by hosting an active futures trading exchange that offers yet another emissions trading platform to the market. It is unlikely that such a limited approach would be successful. It ignores the essential prerequisite of already having a mature commercial framework, service sector support and the essential infrastructure referred to above to attract firms to the city. Companies are highly unlikely to move to a city simply to trade a new contract, no matter how successful, when this can be done equally easily from a desk in another city or country where they are already established.

86. The real competition comes from cities where clusters, commercial centres, services and infrastructure already exist. Possible candidates are:
 - a. New York or Chicago, as US federal and regional emissions trading schemes develop; and/or,
 - b. Hong Kong, or less probably Beijing, as the Chinese and South Korean emissions trading schemes take shape; and/or,
 - c. Sydney or Singapore, as the Australian and New Zealand emissions trading schemes develop; and/or,
 - d. Geneva, because of the flexible Swiss registry system and because of commercial incentives that have encouraged the oil trading community to relocate from other European cities, including London.
87. Other less likely contenders are Frankfurt, Amsterdam and Dubai.
88. To hold on to the revenue generating cluster and maintain its position at the forefront of the rapidly evolving emissions market, regardless of the outcome of the Copenhagen talks, the UK will have to innovate.

Joined-up Policy as a Spur to Innovation

89. In the September 2006 Emissions Trading report, the City of London stated that it would be efficient if all the environmental policies at each level of government - national, regional and local - used a common compliance instrument, or if the compliance instruments used were at least interchangeable, or 'fungible'. So far, each new environmental scheme in the UK has invented its own different compliance instrument - UK allowances, EUAs, Renewable Obligation Certificates, Levy Exemption Certificates, Carbon Reduction Commitment allowances and so forth. This leads to confusion, lack of comparability, and an increasing administrative burden on those who have to comply. The report recommended that it would make it much easier to compare the costs and benefits of a range of different environmental choices at the international, national, regional and local level if all environmental penalties and rewards were expressed in the same way, that is, in terms of EUAs.
90. At that time the EUA was the only allowance that was trading, but as the market has matured the CER has emerged as the front-runner to be the international benchmark emissions allowance. For this reason, it is now proposed that future relevant UK environmental schemes aimed at reducing GHGs use the CER as a compliance instrument.
91. An active policy to coordinate the use of the CER as a compliance instrument would have an invaluable educational and behavioural impact throughout the economy. It would involve the wider public directly as consumers in the financial consequences of their environmental choices. By linking local schemes into the international effort, a local authority can be sure that local citizens are being treated fairly compared with citizens in other countries. If the international effort to arrest climate change is half-hearted, the price of CERs will decline and the cost of local CER-based penalties will also decline. If the international effort is robust, the price of CERs will increase and the rewards from local CER-based policies will be greater.
92. The actual policies involved can be decided at the appropriate governmental level. For example, an authority might decide that it wants to reward new or

refurbished buildings for being energy efficient. When granting planning permission, the building inspector can grant an annual CER penalty or reward to the building, which can be collected or deducted each year through the building rates. Or, an old building may be given a CER reward for installing double-glazing. This reward could be collected by the building owner when the new windows are purchased and installed. Or, as another example, old polluting cars could be penalised by paying a CER 'fine' if they fail to pass national or local authority environmental standards when their owners apply for an annual M.O.T. certificate.

93. A workable scheme needs a methodology for measuring, monitoring and evaluating the environmental parameters targeted for improvement. These issues will determine the mechanical construction of the policy. Once constructed, the use of the CER to implement the policy will improve its efficiency and comparability with other environmental choices. The use of the CER as a compliance tool for environmental policies by both the UK government and local authorities like the GLA would create a market for CERs at all levels of industry down to the household level. Large companies could gain economies of scale in compliance with UK schemes at all levels and with international schemes in all of the countries in which they operate.
94. Local authorities could licence emissions retailers that could buy or sell CERs direct to the public, who may wish to cash in rewards from the local government environmental policy or to pay penalties arising from it. To obtain a licence the retailer would be required to interface with the local authority monitoring, measurement and compliance database. Such a database is a prerequisite of any environmental policy, regardless of the chosen instrument of compliance.
95. Likely retailers are the types of companies who already involved in various types of retail markets and who are already active in the wholesale emissions market. For example:
 - a. Utility companies supplying gas, electricity, water or telephone services;
 - b. Banks;
 - c. Companies who sell petrol to the public;
 - d. National supermarket chains;
 - e. Household and car insurance companies.
96. The motivation for the retailer would be a retail margin, in the same way as in any retail market. The more retailers who are licensed, the more competition there would be to offer the best prices to the person in the street. These retailers can also offer VERs based on voluntary schemes to the public, who may wish purchase and 'retire', that is, cancel, a number of VERs to cover any of their own emissions that are not covered by mandatory government schemes.
97. As mentioned in Section E, under the heading 'Support for the CDM Mechanism', local and regional policies that fall under the radar scheme of the Kyoto Protocol and the EU ETS, have the capability of recognising early CERs generated by projects that are not yet accepted for Kyoto compliance, for example, forestry and carbon capture and storage, but which undoubtedly will be over time as the methodologies for these projects develop. The UK has the capability of providing an early market for these allowances, giving UK firms

an educational advantage in their use and seizing a share of their future contribution to the market.

Tokyo Shows the Way

98. Governor Ishihara of the Tokyo Metropolitan Government ('TMG') gained approval for a city-based cap-and-trade scheme in June 2008. In the early stages of formulating this policy, the TMG consulted CEAG and examined the ideas contained in the City of London's September 2006 report. The scheme will commence in 2010 and targets 1,300 CO₂-emitting office buildings and factories.
99. It is not yet clear if the compliance instrument will be the CER, the Japanese national allowance or a new Tokyo-only allowance. Sources suggest that the scheme will be operated from within the Japanese national registry and that JBIC will perform the role of retailer to the scheme, buying allowances in the wholesale market and selling them in smaller parcels to the 1,300 buildings that are required to comply. This suggests the genesis of a retail market.

The Carbon Reduction Commitment Scheme- an Illustrative Example

100. The Carbon Reduction Commitment Scheme ('CRC') is a mandatory emissions trading scheme, due to be introduced by the UK Government in April 2010, to cover large businesses and public sector organizations which fall below the scope of the EU ETS. As many as 10,000 UK entities may be involved in the scheme.
101. The CRC scheme will use a newly created CRC allowance, which is not fungible with the EU ETS allowances or with Kyoto allowances. These allowances will be auctioned by the Environment Agency, but companies who are long or short for compliance purposes are required to trade amongst themselves to achieve compliance. DECC envisages trade happening on a business to business basis through an electronic bulletin board, rather than in a market. This is anticipated to be necessary because market makers and brokers are unlikely to get involved because of the small transaction size, but also because the scheme envisages a price cap which reduces its attraction to speculators.
102. If the CRC were based on either the EUA or the CER or both, CRC scheme participants would have been able to tap into the wider market liquidity, many would have achieved economies of scale in complying with both the EU ETS and the CRC, they would have received an international carbon price signal more in keeping with that transmitted by the EU ETS and it would have spurred the next evolutionary step in the UK carbon registry. The CRC scheme could have provided a valuable stepping-stone to the world's first mandatory retail emissions market. These objectives were outside the scope of DECC's mandate in designing and seeking consultation feedback on the scheme.
103. Arguably, this approach represents a counsel of perfection in an imperfect world. Individuals and organisations may not respond "rationally" (i.e. to optimise their position) to a carbon price. Carbon market prices are rarely representative of the marginal abatement cost curve; typically they reflect a

combination of the specific design of the market and the behaviour of individuals and organisations with imperfect knowledge and understanding of the options open to them.

104. Furthermore, if unrestricted trading of CERs were allowed in the UK to meet emission constraints, we may well reduce the short-term cost of compliance with regulations, but we may not be creating the investment conditions to optimise the long term cost of compliance within the UK, particularly if the CER price is low. Other non-climate factors, such as energy security or fuel poverty, may mean that options with a nominally higher carbon cost are in fact better for the country than simply the option with the lowest carbon price (for example, using renewable energy to reduce dependency on imported energy sources such as oil and gas). It may be preferable to have the coordinated consideration of such issues at the national level before regional and local schemes based on the CER are introduced.
105. To be able to consider the eligibility of future environmental schemes for the use of CERs as a compliance instrument would require the organisation and coordination of complementary policies. This might involve coordination of the policies of the Greater London Authority and other local authorities, with the City of London and with the UK government's national climate change policy makers. This need not require a change to policy formation responsibilities and could merely involve the coordination of objectives and compliance mechanics, based on the use of the CER within a UK national emissions meta-registry.

Appendix 1

Registries and Transaction Logs- the Mechanics

Kyoto Allowances: Emissions Allowances are no more than a string of numbers held in an electronic 'storage' system, or registry. Kyoto allowances, AAUs, are issued by the UN into the national registries of the 37 capped Annex B countries. CDM CERs are issued by the CDM executive board into the accounts of project participants in the national registry of their choice. ERUs are AAUs that have been converted to ERUs by an Annex B country and issued to project participants in national registries in reward for a JI project. RMUs are additional allowances created by national governments to reward domestic carbon sequestration projects and they too are issued to project participants in its national registry.

Regional or National Scheme Allowances: Annex B countries that have national or regional emissions trading schemes that use a local allowance, for example the European EUA, (see Figure 2) have the facility within their national registries to open compliance accounts for entities targeted by the scheme and in most cases for any third party who wishes to trade in national or regional allowances. In the European system these are called Operator Holding Accounts and Person Holding Accounts respectively.

VERs sit outside the Kyoto national registry system, for example in the CCX or the ACX.

The International Transaction Log ('ITL') is the UN's clearing mechanism for the transfer of tile to Kyoto allowances. The ITL provides a facility to transfer Kyoto allowances, but not national allowances or VERs. For example, if Japan wanted to sell AAUs to New Zealand, the allowances would be checked by the ITL for authenticity and compliance with the Kyoto Protocol and the ITL would confirm that the transfer of allowances to the New Zealand national account from the Japanese national account had occurred. The ITL would not recognise the transfer of Japanese national allowances ('JPAs') to New Zealand because JPAs are not Kyoto allowances. It would however recognise the transfer of CERs from the registry account of, say, an American bank in the Japanese registry to a New Zealand cement producer in the New Zealand registry, because CERs are Kyoto allowances. VERs would not be recognised by the ITL.

The Community Independent Transaction Log ('CITL') is Europe's clearing house for the transfer of Kyoto allowances and EUAs. It allows the transfer of EUAs, CERs and ERUs, but not AAUs, RMUs, other national allowances or VERs. EUAs are AAUs to which a three digit tag has been added to make them acceptable for compliance with the EU ETS. The EU ETS accepts only EUAs, CERs and ERUs, not AAUs or RMUs, from installations targeted by the scheme in compliance with the scheme. VERs would not be recognised by the EU ETS

or the CITL. The CITL currently sits behind the ITL and performs secondary checks on allowance transfers to ensure that the allowances are compliant with the EU ETS. When a European member state comes to comply with the Kyoto Protocol by surrendering allowances to the UNFCCC, the three digit tag is removed and the allowances are converted back from EUAs to AAUs for compliance purposes.

Compliance with the Kyoto Protocol or with a regional or national emissions trading schemes, like the EUETS, can only happen through the ITL and the CITL and can only involve the compliant 'currencies' for the scheme in question.

Appendix 2

A Summary of International Cap-and-Trade Schemes

	Australia	Canada	China	Europe	Japan		New Zealand	S Korea
Scheme Title	Carbon Pollution Reduction Scheme (CPRS)	The Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air Pollution.		EU Emissions Trading Scheme (EU ETS)	JVETS- Japan Voluntary Emissions Trading Scheme to evolve into mandatory scheme. Draft plan published May 2008. Not firm.	Tokyo Cap and Trade Scheme	Climate Change Solutions	Low carbon, green growth
Legislative Status	Green paper July 2008; white paper due December 2008 (See also Garnaut advisory report)	Draft regulations to be published autumn 2008, final regulations autumn 2009.	21/12/2007 Chinese National Petroleum Corporation Assets Management Co., Ltd.(CNPCAM) and Chicago Climate Exchange® (CCX®) Sign a Memorandum of Understanding to Explore Emissions Trading Platform in China. 31/7/2008 - Climate Exchange Plc signed an agreement with the CNPCAM and the city of Tianjin to set up an emissions trading platform in China	The European Community approved the Kyoto Protocol on 25th April 2002 - Decision number 2002/358/EC. The EED (Directive 2003/87/EC) arose from the UNFCCC and the Kyoto Protocol Passed into law on 25th October 2003.	Committee established January 2008 to consider mandatory scheme. Interim Report 15th May 2008. Proposals only.	25/6/2008. Bill passed unanimously in Tokyo Metropolitan Assembly	Climate Change (Emissions Trading and Renewable Preference) Bill to amend the Climate Change Response Act 2002 to introduce a GHG Emissions Trading Scheme. Also amends the Electricity Act 1992 to create a preference for renewable electricity generation by implementing a moratorium on new fossil-fuelled thermal electricity generation, except to the extent necessary to ensure the security of electricity supply.	Bill announced 1st September 2008; Parliamentary hearing due 18th September. A preliminary notice on the legislation of a basic law on climate change, including the formulation of a comprehensive plan on climate change, the introduction of a greenhouse gas transaction system and a greenhouse gas statistics system, and the obligation of greenhouse gas emitting industries to report on emissions of such gases to the government.
Dated Proposed	Proposed July 2008	26/04/2007; further details proposed March 2008.	31st July 2008		Jun-08	June 2007, Tokyo Climate Change Strategy	04/12/2007	

	Australia	Canada	China	Europe	Japan	New Zealand	S Korea	
Scheme Title	Carbon Pollution Reduction Scheme (CPRS)	The Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air Pollution.		EU Emissions Trading Scheme (EU ETS)	JVETS- Japan Voluntary Emissions Trading Scheme to evolve into mandatory scheme. Draft plan published May 2008. Not firm.	Tokyo Cap and Trade Scheme	Climate Change Solutions	Low carbon, green growth
Date Introduced	Mid-2010, runs in financial years ending 30th June.	01/01/2010		01/01/2005. Phase 1 2005-2007; Phase 2 2008-2012;Phase 3 2013-2020	June 2008 announced a trial carbon trading system to be introduced later this year. Initial period up to 2012 using Kyoto -6% target, with annual compliance. The 2013-2020, dependent on Kyoto agreement. Then 2021-2050.	Fiscal Year 2010	1st September 2008	
Sectors covered	1,000 companies, emitting >25,000 tCO2e/year, out of 7.6 million businesses. 75% of Australia's emissions. <u>Transport</u> : Compliance falls on fuel supplier who passes cost to consumer To give households and businesses time to adjust there will be an offsetting cut in fuel taxes. Cent for cent for 3 years, then review. For heavy vehicle users reviewed after 1 year. <u>Forestry</u> : Voluntary opt-in Forest landholders issued with permits additional to the cap (RMUs?) for increases in net CO2 stored. If opted in, a liability would be imposed for any subsequent net reductions in stored CO2. <u>Agriculture</u> : Not covered in 2010. Decision by 2013 for 2015 inclusion. May place compliance burden on food processors who will pass back cost in lower price to farmer or higher price to consumer.	Electricity generation produced by combustion; oil and gas; pulp and paper;iron and steel;iron ore pelting;smelting and refining; cement; lime; potash;and, chemicals and fertilizer.		Combustion activities exceeding 20MW (power stations, on-site generation etc.) ;Oil refineries ;Coke ovens; Cement production; Glass manufacture; Ceramic products manufacture; Pulp production; Paper and board production; Ferrous metal production and processing. Aluminium and ammonia to be added 2013.	Downstream: Large-size emitters in the industry and business sectors (end-users of fossil fuels/electricity) and power companies (with pre-set emissions intensity targets). "Emissions intensity targets" and "Planned activity level" that constitute an emissions allowance will be attained Allocated entities/coverage under shared responsibility. "amount of emissions" = "intensity" x "activity level". Power companies: Baseline and credit method by which they are issued a credit for the difference beyond the target. Large-size energy users: Entirely free allocation	1,300 office buildings and factories, which total CO2 emissions account for about 40% of total emissions from industrial and commercial sectors in Tokyo.	Includes all sectors and all gases by 2013. The Bill does not include deforestation of pre-1990 indigenous forests in the ETS.	Measurement and reporting obligation on S K companies and local government

	Australia	Canada	China	Europe	Japan	New Zealand	S Korea	
Scheme Title	Carbon Pollution Reduction Scheme (CPRS)	The Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air Pollution.		EU Emissions Trading Scheme (EU ETS)	JVETS- Japan Voluntary Emissions Trading Scheme to evolve into mandatory scheme. Draft plan published May 2008. Not firm.	Tokyo Cap and Trade Scheme	Climate Change Solutions	Low carbon, green growth
Gases covered	6 GHGs	6 GHGs		CO2 only in Phase 1 and 2. N2) and PFCs from Phase 3.	All 6 GHGs, but depends on monitoring accuracy, the availability of the amount of emissions, and the share of each GHG within the total amount of GHG emissions in Japan. Realistic to start with a scheme for CO2 emissions from fuel combustion plus any GHGs that satisfy these criteria	CO2 only	All six GHGs	
Targets	To be finalised December 2008. Government will decide sector coverage. These firms must measure and report emissions and submit allowances in October each year. Effective cap set by the number of allowances the government decides to auction. Rolling 5 year forward cap and gateway range out to 10 years.	Reducing Canada's total GHG emissions, relative to 2006 levels, by 20% by 2020 and by 60% to 70% by 2050. Existing facilities must reduce emission intensity by 18% relative to 2006 by 2010 and 2% per year thereafter. Equivalent to -26% by 2015 and -33% by 2020. New facilities (2004+) must reduce emissions intensity by 2% per year after 3 years of operation. Fixed process emissions for which there is no alternative technology have a 0% reduction target. Intend to move to fixed emissions targets in 2020-2025, rather than emissions intensity targets.		95% of BAU allocated free for Phase 1; 90% of BAU allocated free for Phase 2. Declining by 1.74% pa. a thereafter out to 2020. No international agreement => 20% reduction target and unused Phase II CERs/ERUs can be used. If international agreement => 30% reduction target and the limit on CERs/ERUs will be increased up to half of the additional reduction effort.	Did not set short-term targets for national cuts, but said Japan could match the EU's ambition . Aim to reduce greenhouse gas emissions by 60-80% by 2050.	Reducing Tokyo emissions by 25 percent from 2000 levels by 2020. 1st phase from FY2010 through FY2014. Compliance assessment mid-2015. --2nd phase from FY2015 through FY2019. Compliance assessment mid-2020. Monitoring and Reporting: every year. Caps: Base year emission X 5 (years) X Compliance factor (e.g. 0.9) Base year = average of last three years.	Absolute rather than intensity-based unit obligations. 'Unit obligations' refers to when sectors must register as participants in the ETS and surrender units in line with their level of greenhouse gas emissions at the end of compliance periods. These obligations start on 1 January 2011 for liquid fossil fuels (transport) and on 1 January 2013 (rather than 2010) for imported hydro fluorocarbons (HFCs) and imported per fluorocarbons (PFCs). For agriculture, the ability to pass an Order-in-Council to implement a farm-level point of obligation now expires on 30 June 2010, instead of 1 January 2013.	

	Australia	Canada	China	Europe	Japan	New Zealand	S Korea	
Scheme Title	Carbon Pollution Reduction Scheme (CPRS)	The Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air Pollution.		EU Emissions Trading Scheme (EU ETS)	JVETS- Japan Voluntary Emissions Trading Scheme to evolve into mandatory scheme. Draft plan published May 2008. Not firm.	Tokyo Cap and Trade Scheme	Climate Change Solutions	Low carbon, green growth
Compliance Mechanisms	1. Government auctioned AEUUs. (Not clear if tagged AAUs or new instrument)	1. Payment into a technology fund to reduce GHGs across industry, administered by independent third party. No inter-regional transfer of wealth allowed. Up to 70% of target in 2010, 65% in 2011, 60% in 2012; 55% in 2013, 50% in 2014, 40% in 2015, 10% in 2016 and 2017. Then no further compliance by this method. In 2010-2012 the contribution rate will be \$Can 15/tCO ₂ e, 2013 \$Can 20/tCO ₂ e, escalating thereafter with the nominal rate of GDP growth up to 2017. (This constitutes a price cap?)		Compliance using EAUs, which are tagged AAUs.	1. Allowances are JPAs under JVETS. No price cap envisaged.	1. NZUs	The bill will lay foundation for allocating greenhouse gas emission allowances to those, who emit more than certain levels of such gases, and permitting transactions of all or some of the emission allowances.	
	2. CERs, ERUs and RMUs only, no AAUs. CERs would be accepted (for the period 2010-11 to 2012-13), except for those that have associated contingent obligations and high administrative costs: currently, temporary certified emission reductions and long term CERs from forestry-based projects. CERs and ERUs generated 2008-2012 recognised for compliance in the CPRS in 2012-13. CERs generated through abatement from 2013 onwards by projects established 2008-2012 would be recognised for compliance in the CPRS in 2012-13 and subsequent years. Limits may apply, not yet specified.	2. Inter-firm trading. Companies that reduce emissions intensity receive credit = (Target intensity-actual intensity) x Production. Can sell to other third parties including other regulated firms. What about others?		CERs and ERUs accepted from Phase 2 up to national limits that average 10% overall.	2. CERs and ERUs allowed. Once converted to jCERs and jERUs for compliance with JVETS cannot be reconverted to CERs and ERUs for international trading. Subject to ceiling.	2. The Bill prohibits participants from surrendering assigned amounts units (AAUs) imported during the first commitment period for compliance with their unit obligations accruing after the first commitment period. This doesn't extend to other Kyoto units – New Zealand AAUs, Certified Emission Reductions (CERs), Emission Reduction Units (ERUs) and Removal Units (RMUs). The Minister retains an ability to regulate which units can enter the ETS in the future.		
	3. Domestic offsets may be allowed.	3. Verified offsets from unregulated sectors in Canada only can be used. CDM CERs can be used up to 10% of the firm's total target, excluding forest sinks.			3. Domestic offsets may be allowed. Subject to ceiling.			

	Australia	Canada	China	Europe	Japan		New Zealand	S Korea
Scheme Title	Carbon Pollution Reduction Scheme (CPRS)	The Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air Pollution.		EU Emissions Trading Scheme (EU ETS)	JVETS- Japan Voluntary Emissions Trading Scheme to evolve into mandatory scheme. Draft plan published May 2008. Not firm.	Tokyo Cap and Trade Scheme	Climate Change Solutions	Low carbon, green growth
Credit for Early Action		One -off share of credit for early action between 1992-2006. Total credits pot =15Mt, subject to limit in use of 5Mt/year.		Subject to national policy.				
Allowance Allocation	100% auctioning, except for initial assistance for activities with an emissions intensity > 2,000 tCO ₂ e/\$Aus million revenue: 90 % of industry average emissions/ unit of output > 1,500 and <2,000 tCO ₂ e/\$ Aus million revenue: 60% Government's proposal is to allocate up to around 30% of national permits to EITE industries.	Not yet specified.		The Directive has a target of an 8% reduction on 1990 GHG emissions in the EU by the period 2008-12. In Phases 1 and 2 National governments are responsible for allocating emissions allowances through a National Allocation Plan (NAP) . The EC responsible for ensuring that NAPs are objective and transparent and do not distort the scheme. From Phase 3 it is proposed that the EC will control a centralised cap and allocated to sectors within each country	Not yet specified. May be free, based on grandfathering or benchmarking, or auctioning. Likely to be free allocation initially except for sectors that can pass through costs. Building up to full auctioning.		Allocation to industry and agriculture based on 90 per cent of 2005 emissions levels. The phase-out of allocation for industry and agriculture runs from 2019 until 2029.	

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Auction design	Ascending clock			National auctions in Phase 2. Attempt at harmonisation in Phase 3. Falling clock.				
Auction frequency	4 auctions per financial year held quarterly, one of which held one month before acquittal date, after end of financial year. First held early 2010, auctioning first 4 year vintages			Up to national governments to determine. Subject to consultation.				
Participation	Open to all	Open to foreign nationals		Open to foreign nationals				
Banking/borrowing	Unlimited banking. Can borrow up to 5% from next year only.			Banking allowed. Borrowing from next year allowed.	Banking allowed and borrowing with limits to be specified.	Banking allowed. Borrowing not allowed.		

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Linkage	Objective of full international linkage eventually. In short term discussing linkage with NZ.	May recognise USA offsets at a later date, to be specified.		Norway, Lichtenstein and Iceland.	To be considered. No early link likely.		Claims complete international linkage, but not necessarily workable	
Non-Compliance penalties	To be proposed December 2008			€40/tonne in Phase 1; €100/tonne in Phase 2.	Charge to be levied and non-compliance amount to be offset in next period.	Financial penalty will be applied. Not yet specified.		

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Other provisions and general notes	<p>100% revenue hypothecation. Increase cash payments above automatic cost of living index, to pensioners, carers, and provide other assistance in meeting overall increase in the cost of living from CPRS. Not linked to energy use. Assist other low-income households through the tax and payment system and assist middle-income households Review annually in the Budget . Introduce energy efficiency measures and consumer information to help households take practical action to reduce energy bills. Terms of reference for Australia's Future Tax System Review and the interrelationship between the tax and transfer payments in the CPRS. Funding to CCS via the \$500 million Clean Coal Fund aims to ensure the long-term viability of domestic coal-fired generation and of coal-producing regions.To protect investment will introduce the Electricity Sector Adjustment Scheme (ESAS). Assistance based on the generator's capacity, and whether it uses black or brown coal.</p>			NER set aside for new entrants to sectors covered by EU ETS.	<p>2005, Initially 34 companies participated in a Voluntary Emissions Trading Scheme. Currently 200 participants. Establishment of administrative carbon market board like the Carbon Market Efficiency Board now under consideration in the US shall be considered. JVET registry used for mandatory scheme compliance. May have to be linked to national registry to accommodate CERS/ERUs and future linkage. Protection for trade exposed sectors to be considered.</p>	Registry to be established by TMG	<p>Self-assessment model for monitoring, reporting and verification. Voluntary and mandatory reporting for liquid fossil fuels, synthetic gases, agriculture, waste and removal activities relating to HFCs and PFCs. Voluntary reporting gives participants the option of registering as participants in order to begin reporting their emissions and get used to reporting systems, such as preparing emissions returns. No penalties apply to voluntary reporting. Mandatory reporting obligations start the year following voluntary reporting, and participants are then required to complete an emissions return. Participants do not have to surrender units but penalties and offences do apply for failing to report. May include a NER but will not necessarily use this provision.</p>	Will establish a new committee to review and approve basic policy and strategy. Will be chaired by the president, with the prime minister acting as vice chair. May involve central and local government involvement.

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Review		1st review 2012 and every 5 years thereafter.						
Weblinks	http://www.climatechange.gov.au/greenpaper/index.html	http://www.ec.gc.ca/virage-corner/2008-03/541_eng.htm#introduction		http://ec.europa.eu/environment/climate/emission/index_en.htm	http://www.env.go.jp/en/earth/cc/ajets-ir-080520.pdf	http://www.japanfs.org/en/public/gov_19.html and http://www.kankyo.metro.tokyo.jp/kouhou/english/pdf/Tokyo's%20cap&trade%20system_080625.pdf	http://www.climatechange.govt.nz/	Korea.net

	Switzerland	Taiwan	USA			
Scheme Title	Schweizer Emissionshandelsssystem; Swiss ETS	Greenhouse Gas Reduction Act	Federal Scheme	Regional Greenhouse Gas Initiative (Reggie)	Western Climate Initiative	Midwestern Regional Greenhouse Gas Reduction Accord.
Legislative Status	Federal Act on the Reduction of CO2 emissions has been established.	Climate Bill including GHG trading put forward in April 2008 by the Environmental Protection Agency (EPA). It is still being debated.	House of Representatives cap-and-trade bill to be introduced in September 2008. Boucher and Dingell bill.	Agreement, not legislation. The Model Rule provides states flexibility in adopting provisions regarding applicability and source exemptions, allowance allocations and allowance set-asides, and permitting. The Model Rule is analogous to the EED. The states produce the CO2 budget for the programme, which is analogous to the sum total of the European NAPs.	Partners: Arizona, California, New Mexico, Oregon, Washington, Utah British Columbia, Manitoba, Montana, Quebec and Ontario Observers: Alaska, Colorado, Idaho, Kansas, Nevada, Wyoming, Saskatchewan, Baja California, Chihuahua, Coahuila, Nuevo Leon, Sonora and Tamaulipas.	Partners: Wisconsin, Minnesota, Illinois, Iowa, Michigan, Kansas and Manitoba Observers: Indiana, Ohio, South Dakota,
Dated Proposed				April, 2003	February, 2007. Draft design document July 23rd, 2008	November 15th 2007

	Switzerland	Taiwan	USA			
Scheme Title	Schweizer Emissionshandelsssystem; Swiss ETS	Greenhouse Gas Reduction Act	Federal Scheme	Regional Greenhouse Gas Initiative (Reggie)	Western Climate Initiative	Midwestern Regional Greenhouse Gas Reduction Accord.
Date Introduced	01/01/2008			01/01/2009	2012-2020	
Sectors covered				Mandatory cap-and-trade system for Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, and Vermont aim to reduce CO2 in the fossil-fuelled power plants of > 25MW. The definition of “fossil fuel-fired” varies depending on when a unit commences operation. A unit that commences operation on or after 1/1/2005 is fossil fuel-fired if fossil fuel comprises > 5% of its total annual heat input. If commenced before January 1, 2005 is fossil fuel-fired if fossil fuel comprises > 50% of its total annual heat input. Biomass can be deducted.	Actions in all sectors, including but not limited to: stationary sources, energy supply, residential, commercial, industrial, transportation, waste management, agriculture, and forestry. CO2 emissions from the combustion of biomass or biofuel are not included. Emission threshold: 25,000 tonnes CO2e p.a. defines the facilities or entities (e.g., first jurisdictional deliverer, fuel distributor, fuel blender) that would have a regulatory compliance obligation under the cap-and-trade program.	

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Gases covered	CO2 only			CO2 only	All six GHGs	All six GHGs
Targets	10% reduction below 1990 levels by 2010	New government election commitment to hold greenhouse gas emissions at 2008 levels by 2020, reducing them to 2000 levels by 2025 and cutting them to half of 2000 levels by 2050.		Stabilize power generation CO2 emissions at 4% above annual emissions for 2000-2004 over the period 2009-2014 =188 million short tons. Then decline 2.5% p.a. 2015-2019.	Goal memo published 22/8/2007. Aggregate reduction in GHGs of 15% below 2005 levels by 2020. Straight line trajectory from the year of initial coverage (2012 for some sources and 2015 for other sources) to 2020. State allowance budgets to be set three years in advance i.e. 2009.	

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Scheme Title	Schweizer Emissionshandelssystem; Swiss ETS	Greenhouse Gas Reduction Act	Federal Scheme	Regional Greenhouse Gas Initiative (Reggie)	Western Climate Initiative	Midwestern Regional Greenhouse Gas Reduction Accord.
Compliance Mechanisms	1. Businesses are subject to a CO2 tax but can agree to cut emissions. Business proposes cap and if agreed receives an allocation of free allowances in the national registry.			1. Purchase of CO2 Allowances, nick-named RGAs by the market.	1. Individual jurisdictions may use fiscal measures that contribute to achieving overall comparable GHG emission reductions and internalize the price of carbon as expected through the regional cap-and-trade program for transportation and residential/commercial fuels. British Columbia currently has a carbon tax. By 2012 the Partners will determine the mechanism for integrating it into the cap-and-trade program.	
	2. Can use up to 8% CERs and ERUs. Companies who have opted to pay tax can also use CERs and ERUs as an alternative.	2. Offset credits from tree planting both domestically and abroad could be cleared for use in a Taiwanese emissions trading		2. Proposed recognition US 'offset credits', reductions of GHG emissions that are achieved outside the electricity sector such as at landfills, farming operations etc. These must be in a participating state or a state that has signed an MOU with Reggie. Subject to additionality standards. The use of CO2 offset allowances is constrained to 3.3% of a unit's total compliance obligation during a control period, though this may be expanded to 5% and 10% if a stage one or stage two trigger event occurs, respectively.	2. Allowances from other government approved GHG schemes may be used. Subject to a limit to be agreed and applied at the entity level. 10% proposed. Likely to be sourced in WCI partner states or throughout USA, Canada and Mexico. WCI states must be able to enforce integrity of offset project.	
				3. Other offset credits may be used but only if there has been a stage two price event i.e. >\$10/ton in 2005 dollars.		

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Credit for Early Action				Can apply by 1/5/2009 for free early reduction allowances (ERAs) . Not auctioned and allocated in addition to CO2 budget of 188 million short tonnes.	Each Partner has discretion to give credit for early actions, but any credit for early action will come from within the cap and will come out of the individual Partner's allowance budget. Early action credits will not be added to or be on top of the amount of allowances in each Partner's allowance budget	
Allowance Allocation	Free allocation			Allowances will be allocated for entire regional emissions budget of 188 million short tons in 2009-2014 i.e. 4% above 2000-2004 average emissions. 10-40% free in various states, the rest by auction. Each state auctions its share of the budget. Min. 25% of allowances set aside for consumer benefit programmes. Most states auctioning the remaining 75%.	All allowances to be allocated or retired each compliance period of 3 years. Minimum percentage for auctioning and coordinated regional auctioning platform to be agreed autumn 2008.	
Auction design				Regional auction platform used. Reserve price for 1st auction=\$1.86/ton.		

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Auction frequency				Initial auction planned for September 25th, 2008, then December 17th and quarterly thereafter.		
Participation	Open to foreign nationals			Non-utilities can compete in auction. Secondary market already trading.		
Banking/borrowing	Federal Act on the Reduction of CO2 emissions has been established.			Banking allowed. Borrowing not allowed. The compliance period may be extended. Stage One: If the 12 month rolling average price is >\$7/short ton (2005 dollars), then the use of offsets can be increased from 3.3% to 5%. Stage Two: If the 12 month rolling average price is >\$10/ short ton (2005 dollars) then the offset limit increases to 10%; compliance period extended to 4 years; offset allowances can be awarded for the retirement of 'greenhouse gas emissions reduction credits certified pursuant to the United Nations Framework Convention on Climate Change (UNFCCC) or protocols adopted through the UNFCCC process.' The price trigger provisions include a 14month market settling period, which commences at the start of each new compliance period. The twelve- month rolling averages used to calculate the stage one and stage two trigger events cannot include the 14month market settling period. Therefore, the earliest that either trigger event can occur is 26 months after the commencement of a compliance period.	Banking allowed but subject to a limit on the number of allowances a 'party' may hold. No borrowing.	

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Linkage	Aim to link with EU ETS.			None, except in the case of a stage two price spike. (See Banking/borrowing.)		
Non-Compliance penalties	Can elect to pay tax instead = price cap!				Enforced at the Partner level. Must surrender 3 allowances for every one not surrendered by due date.	

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Scheme Title	Schweizer Emissionshandelssystem; Swiss ETS	Greenhouse Gas Reduction Act	Federal Scheme	Regional Greenhouse Gas Initiative (Reggie)	Western Climate Initiative	Midwestern Regional Greenhouse Gas Reduction Accord.
Other provisions and general notes		3 companies - Taipower, China Steel Corporation and CPC, all state-owned-account for more than half of all Taiwan's carbon emissions. The residential, commercial and transport sectors together account for only 17% of Taiwan's carbon dioxide output		3 year compliance cycle. Coverage is equivalent to 95% of CO2 emissions from the power generating sector.	3 year compliance cycle. A minimum percentage of the value of each Partner's allowance budget (for example, through set-asides of allowances, through a distribution of revenues from the auctioning of allowances, or other means) may be dedicated to one or more of the following public purposes that provide benefits in each Partner jurisdiction: Energy efficiency and renewables, R&D particularly CCS and sequestration in agriculture and forestry and other uncapped sources. The remainder at Partner's discretion.	The Accord will: Establish greenhouse gas reduction targets and timeframes consistent with MGA member states' targets; Develop a market-based and multi-sector cap-and-trade mechanism to help achieve those reduction targets; Establish a system to enable tracking, management, and crediting for entities that reduce greenhouse gas emissions; and, Develop and implement additional steps as needed to achieve the reduction targets, such as a low-carbon fuel standards and regional incentives and funding mechanisms.
Review						
Weblinks	http://www.bafu.admin.ch/emissionshandel/05538/05540/index.html?lang=en			http://www.rggi.org/docs/program_summary_10_07.pdf	http://www.westernclimateinitiative.org/	http://www.midwesterngovernors.org/govenergyinnov.htm