Managing the Environmental Impact of Energy Use
The Role of Emissions Trading

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Abstract

It is now widely recognised that some form of economic incentive, most likely through emissions trading, is required to induce the development and adoption of new technology and practices needed to reduce global greenhouse gas emissions. Extensive international experience with emissions trading is now being gained through the Kyoto Protocol's Clean Development Mechanism (CDM), and the European Union's Emissions Trading Scheme (EU ETS). Trading under these schemes is growing rapidly and is already impacting on the Asia-Pacific region. Turnover in 2006 was around 1.6 billion tonnes CO2e valued at around US$30 billion, double the 2005 volume and value.

While these schemes are demonstrating success in marshalling emission abatement activity in the short and medium term, the challenge remains to build on this foundation to establish a more robust, comprehensive and long-term market structure incorporating all major emitters, particularly those in the Asia-Pacific. A focus of this challenge is the development of a post-Kyoto international policy regime, which will be the subject of multilateral negotiations under the UN Framework Convention on Climate Change (UNFCCC).

In developing the new regime, there are a number of potentially influential international and regional drivers. These include the EU, the US, Australia, and specifically in the Asia-Pacific, APEC and the Asia-Pacific Partnership for Clean Development and Climate (AP6). More flexible market structures, to account for particular country circumstances, are possible than currently apply under the Kyoto Protocol, and these need to be researched and implemented to encourage wider market participation by all major emitters. To support these evolving policy and market frameworks, there is also a need for developed countries to facilitate a more extensive program of relevant R&D, technology transfer, capacity building and investment in the developing world. It is suggested that PECC can play a valuable role in exploring and developing appropriate programs to meet the needs of the region.

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Managing the Environmental Impact of Energy Use

The Role of Emissions Trading

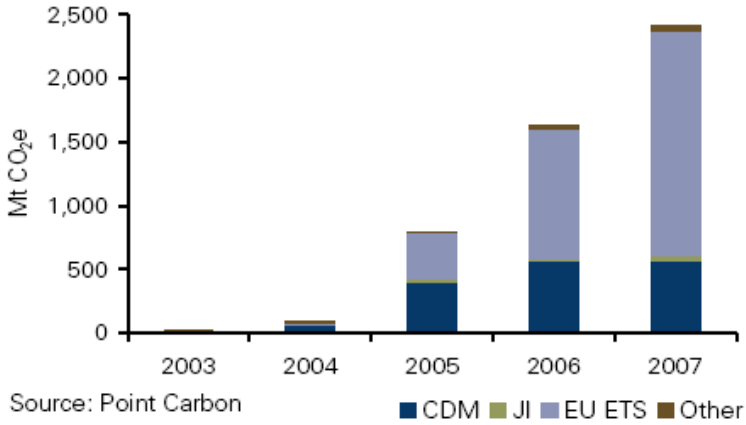
It is now widely recognised that some form of economic incentive is required to induce the development and adoption of new technology and practices needed to reduce global greenhouse gas emissions. Emissions trading is the most prospective economic instrument and already extensive international experience is being gained in the establishment and management of different types of trading schemes. In particular, emissions trading under the Kyoto Protocol's Clean Development Mechanism (CDM), and the European Union's Emissions Trading Scheme (EU ETS), is growing rapidly and is already impacting on the Asia-Pacific region.

Under these schemes market turnover is currently around 1.6 billion tonnes CO2e[1] per year valued at around US$30 billion. This is up from around 0.8 billion tonnes and $12 billion in 2005 – see Figure 1. The bulk of traded volume in 2006 was for Kyoto compliance purposes and was roughly divided 2:1 between trade in allocated 'allowances' under the EU ETS and trade in project based credits under the Clean Development Mechanism (CDM).[2]

The growth in traded volume stems from:

- Efforts to meet Kyoto Protocol commitments
- Gearing up of the Kyoto mechanisms, especially the Clean Development Mechanism
- The operation of Phase 1 (2005-2007) of the EU Emissions Trading Scheme (EUETS)

Figure 1: Reported and estimated contracts 2003-06, forecast for 2007



[1] CO2e – carbon dioxide equivalent; allows other greenhouse gases such as methane to be measured in standard terms.
[2] Point Carbon (2007), Carbon 2007 www.pointcarbon.com

Further market development

Over the next few years, the volume and value of international emissions trading will continue to grow, as will public, commercial and government interest in trading. It is estimated that traded volume in 2007 will be around 2.4 billion tonnes, valued at over US$30 billion.[3] Key factors in this growth that will continue to be important to the end of the decade include:

- Ongoing implementation of the Kyoto Protocol and its flexibility mechanisms, especially CDM
- Ramping up of trading related to the second phase of the EU Emissions Trading Scheme, with associated secondary markets and international linkages
- Growing private and state-government based ET activity in the US and Australia together with possible pressure for national trading initiatives

Trading under the Kyoto Protocol – the Clean Development Mechanism

Having entered into force in early 2005, the Protocol is now well down the track to full implementation. This is particularly so for the CDM which is one of the Protocol's flexibility mechanisms.[4] Under the CDM, Annex 1 (developed) country parties to the KP can invest in approved emission abatement projects in developing countries that are parties to the Protocol. To the extent that these projects reduce emissions below what would have otherwise been the case, they can generate tradable emission credits (known as Certified Emission Reductions or CERs). These can be used by the Annex 1 party to help meet their binding Kyoto emission targets.

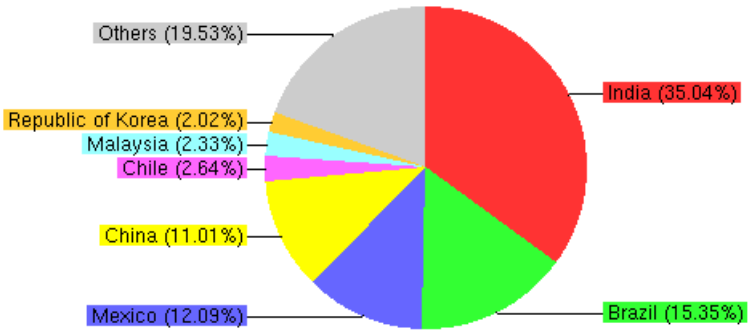
All Annex 1 (developed country) parties to the KP are currently looking to buy CERs to help meet their commitments and this is generating a strong demand for good quality abatement projects in developing countries. Consequently, 2006 and early 2007 have seen a rapid growth in the approval rate for projects with over 600 projects now registered by the CDM Executive Board across 44 developing host countries. These projects represent a total expected abatement of over 870 million tonnes CO2e.[5]

Host countries

There are a diverse range of developing countries hosting CDM projects but four countries have so far proven the most prospective in terms of project numbers. These are China, India, Mexico and Brazil – see Figure 2. In terms of regions, the Asia Pacific is predominant accounting for around 57% of registered projects.

[3] Point Carbon (2007), Carbon 2007 www.pointcarbon.com
[4] See UN Framework Convention on Climate Change site www.unfccc.int
[5] See UNFCCC CDM site http://cdm.unfccc.int/

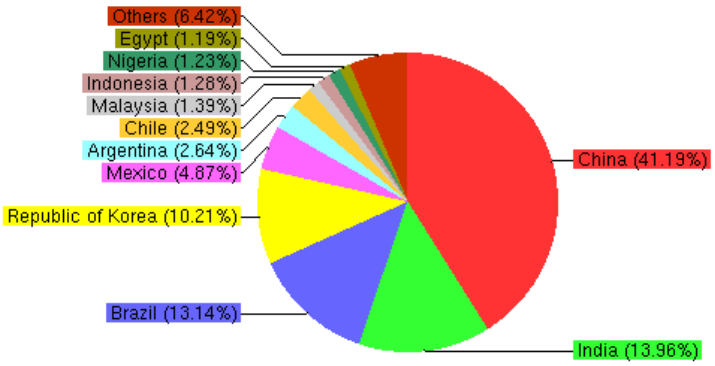
Figure 2: Countries hosting registered CDM projects



Source: http://cdm.unfccc.int

Considered in terms of the volume of abatement anticipated from the hosted projects, and therefore the volume of tradable CERs generated, the picture changes with large abatement projects in China and South Korea increasing the significance of these hosts. In these terms China, India, Brazil and South Korea account for over 78% of the expected CERs from currently registered projects. See Figure 3

Figure 3: Distribution of expected CERs from registered projects



Source: http://cdm.unfccc.int

Investor countries

The EU ETS provides a market incentive for European governments and firms to invest in CDM projects because the resulting emission credits (CERs) can be used in Europe to meet their allocated emission targets. This is reflected in the distribution of projects attributed to particular investor countries with around 85% funded from Europe. Another 13% are funded from Japan and 3% from Canada – see Figure 4. The significant share of projects supported through the UK reflects the effort put in by the UK government and industry to make London a global emissions trading and investment centre.

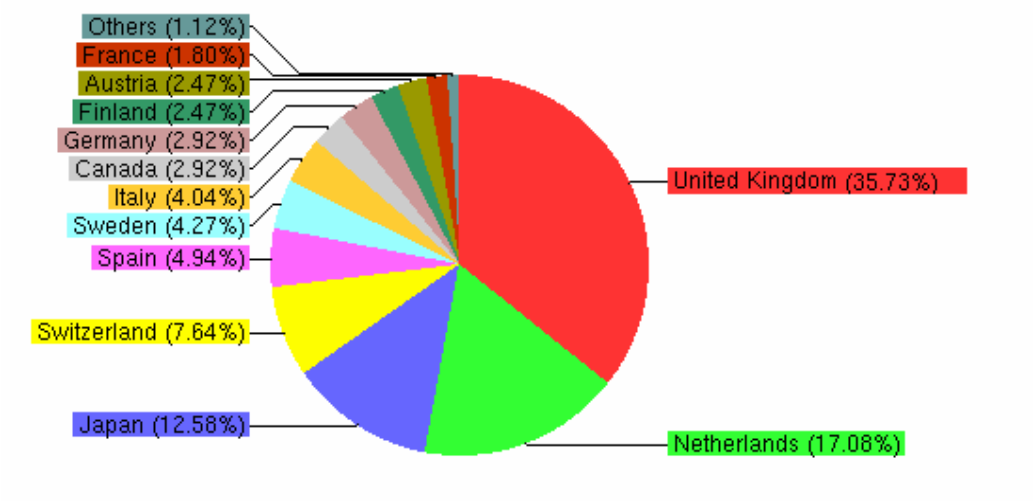


Figure 4: Distribution of projects by investor country

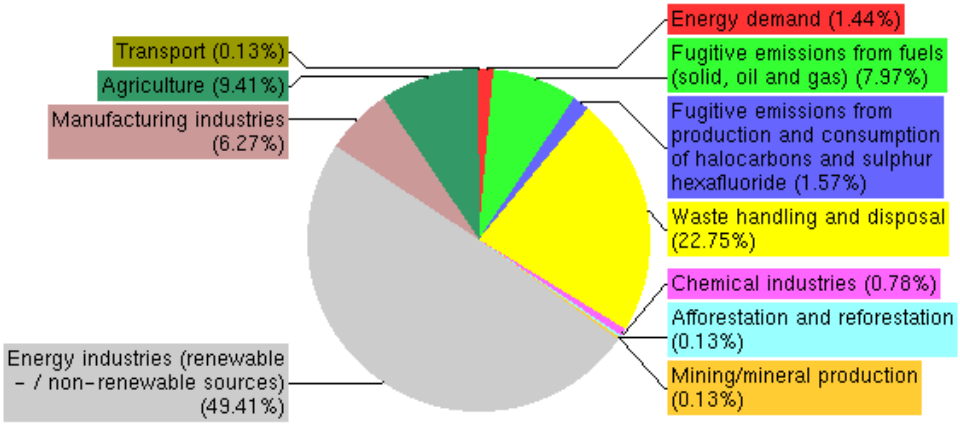
Source: http://cdm.unfccc.int

The US and Australia are notably absent as investor countries. Having not ratified the Kyoto Protocol, the US and Australia remain largely on the sidelines of the CDM marketplace – they have not committed to any national emission target, their companies cannot hold CERs in local registries and there are no local agencies to support US or Australian company involvement.[6]

Sectoral scope

Energy sector projects dominate the CDM registered project list but significant numbers of projects have also been approved in waste handling, agriculture, and manufacturing industries. The sectoral break-up of projects is shown in Figure 5.

Figure 5: Distribution of registered CDM projects by scope



Source: http://cdm.unfccc.int

[6] Nevertheless, a few companies have been able to venture into the field of play with innovative joint ventures and financial arrangements. See Beck & Gray (2006), Clean Development Mechanism Comes of Age, AETF Review, June/July 2006 (www.aetf.net.au)

New potential – forestry and geosequestration

Two new areas for potential CDM projects are likely to be of growing interest to investors in the Asia-Pacific – forestry, and carbon capture and storage (CCS), also know as geosequestration.

Afforestation and reforestation projects can now qualify as CDM projects and a range of projects are in the pipeline for CDM Executive Board approval. So far one project has now been registered – a project to facilitate reforestation in the Pearl River Basin in China.[7]

Meanwhile, the possible role of CCS in the CDM is still being considered by the UN Framework Convention on Climate Change (UNFCCC). There are two main concerns. The first is that developing countries may not be the right proving ground for the emerging CCS technologies. The second is that CCS projects require a long-term liability, which goes far beyond the present maximum crediting lifetime of 21 years for CDM projects.

Also, allowing CCS in the CDM would have direct implications for the energy and emissions profile of the host country, which would also have an impact on that country's position during post-Kyoto negotiations. For example, implementation of CCS projects in China and India for a period of 30 years could reduce these countries' incentives to adopt emission reduction targets under a future climate policy regime.

The UNFCCC is taking submissions on a range of technical issues and will undertake further analysis with a view to taking a decision in 2008 on the inclusion of CCS in the CDM.[8]

National Authorities and Operational Entities

The establishment of Designated National Authorities (DNAs) and the certification of increasing numbers of private sector agents known as Designated Operational Entities (DOEs) have also supported the growth in CDM project activity.

DNAs, usually government agencies, aim to provide a 'one-stop-shop' for project proponents seeking information about CDM potential, local regulatory requirements, government facilitation, etc. To date 118 countries have established DNAs comprising 22 Annex 1 (developed) countries and 96 non-Annex 1 (developing) countries. These include most countries in the Asia-Pacific with the exception of the US and Australia.

DOEs are companies that act as agents for the CDM Executive Board in assessing CDM project proposals and verifying and certifying CERs. To date sixteen companies have been certified from Europe, Japan, Korea and South Africa.

[7] See http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154534875.41/view.html for details.
[8] See IEA GHG Greenhouse Issues newsletter: http://www.ieagreen.org.uk/newsletter/march85.pdf

European Union Emissions Trading Scheme (EU ETS)

The EU ETS,[9] together with the CDM, continues to be a major driver in building the international market. The first trial phase of the EU ETS which covers all 25countries of the EU, formally started on 1 January 2005 and will continue until the end of 2007. The second and main phase will cover 2008 to 2012 corresponding to the Kyoto commitment period. Over 12000 installations across the main emitting sectors have been allocated emissions limits with the Phase 2 limits aimed at ensuring the EU meets its Kyoto targets.

Trading volume in 2006 was over 1 billion tonnes CO2e valued at around US$23 billion. Traded volume in 2007 is predicted to be around 1.7 billion tonnes.

For the first phase, each of the 25 member states determined its own allocation method and submitted the resulting national allocation plan (NAP) to the European Commission for approval. In the absence of good data on expected emissions and abatement costs, this process has been problematic with many countries apparently over allocating. Prices have been volatile and, following inventory reports which strengthened expectations of over supply, they dropped suddenly in April 2006 from a high close to €30 to a low of below € 10 in early May. Phase 1 prices subsequently stabilised at around € 16 but since September 2006 have declined steadily to around € 1 suggesting that the Phase 1 market is long and now winding down.

On the other hand, with most EU member states now having submitted and finalised their Phase 2 National Allocation Plans (NAPs), Phase 2 trading has picked up. Prices in late 2006 and early 2007 have been reasonably stable at around € 16 (approximately US$20).

Traded volume has trended upward and is now typically in the range 3 – 5 million per day but is still prone to volatility when large bids and offers are made. The rapid development of the EU market has stimulated the active involvement of five trading exchanges which are now trading around 60% of the traded volume.

Linking with the CDM

A driver of fundamental importance to the developing global emissions market and to emission abatement in the Asia Pacific, is the direct link between the EU ETS and the Kyoto mechanisms through the EU *Linking Directive.* This allows EU member states and companies to use certain external sources of emissions credits, particularly the CDM, to help meet their commitments under the EU ETS.

For CDM to be utilised, eligible projects must be approved and verified under the Kyoto Protocol's CDM procedures but the EU has imposed an additional condition that excludes carbon sink projects. EU buyers now account for over 80% of CER purchases.

The possibility also exists for links to be built with non-EU trading schemes providing the countries involved are parties to the Protocol and the schemes are compatible with the EU ETS. Norway, for example, has implemented a compatible national scheme and, in the longer term links could be envisaged with schemes in Canada, NZ, Japan and possibly Russia.

[9] EU Emissions Trading Scheme site http://europa.eu.int/comm/environment/climat/emission.htm

Without ratification, national schemes in Australia and the US would be excluded. But the door is left open for possible links with regional schemes in these countries. The recent agreement between California and the UK to explore the scope for a joint emissions market could lead to such a link.

Drivers for the future

While the development of international emissions trading under the CDM and the EU ETS outlined above can be considered a qualified success, the challenge ahead is to build on this experience to establish a more comprehensive, long-term scheme.

A focus of this challenge is the international policy regime after 2012. This will be the subject of multilateral negotiations under the UNFCCC starting this year. While there is considerable uncertainty about the ultimate structure of a post-Kyoto regime, there is a general consensus that emissions trading must play a key role.

In developing the new regime, there are a number of potentially influential international and regional drivers. These include the ongoing operation of the EU ETS, developments in the US and Australia, and, in the Asia-Pacific, APEC and the Asia-Pacific Partnership for Clean Development and Climate (AP6).

EU ETS to continue post 2012

The EU is committed to maintaining the EU ETS in the long run, including the ongoing linkage to developing country abatement projects along the lines of the CDM, and this can be expected to have a major influence on post-Kyoto negotiations.

In March 2007, EU leaders approved a package of measures aimed at keeping climate change to manageable levels. The Communication outlining the package is titled *"Limiting Global Climate Change to 2° Celsius: The way ahead for 2020 and beyond"*.[10]

The package is an integrated energy and climate policy agenda for Europe and is also aimed at providing a major contribution to the development of a global post-Kyoto climate regime. It sets out ambitious targets to be met by 2020 – 20% improvement in energy efficiency, 20% renewable energy target, and 10% biofuels target. For greenhouse gases, it commits to the ongoing operation of the EU ETS and proposes a clear, independent commitment to reduce emissions by at least 20% by 2020, irrespective of what others do.

For the international climate change regime, the EU proposes a developed country combined target of 30% below 1990 levels by 2020. If such an agreement could be achieved, the EU would commit to a 30% reduction.

The European Commission is now undertaking a review of the EU ETS in order to plan for its ongoing development and operation post 2012 (Phase 3). Stakeholder consultations and analyses are underway with a draft legislative proposal expected in mid to late 2007.

[10] See http://ec.europa.eu/environment/climat/future_action.htm

United States

In the US, with a Democratic Party majority now in place, there are now more concerted attempts in the Senate and Congress to gain support for a national cap-and-trade scheme. The Democrats are also more interested in participating in a multilateral scheme under the UN. However, there still seems little likelihood of a national trading scheme being implemented or more active UN involvement under the Bush Administration. Most trading related policy development and activity continues to occur through State and private initiatives, especially through the Regional Greenhouse Gas Initiative (RGGI) and the Chicago Climate Exchange.

RGGI, which involves seven north-eastern and mid-Atlantic States, is moving forward with the implementation of a multi-state cap-and-trade scheme initially to cover the electricity sector. Model legislation, involving the details of the cap-and-trade scheme, has been agreed and the participating States are now seeking the required legislative or regulatory approvals to adopt the program. Pending the completion of this process, the RGGI program will take effect on January 1, 2009.

Elsewhere in the US, California and four other western states, Arizona, New Mexico, Oregon and Washington, have formed the Western Regional Climate Action Initiative with the objective of devising a market-based emission abatement scheme.

The best developed private trading initiative in the US remains the Chicago Climate Exchange (CCX) which involves companies voluntarily committing to legally binding emissions reductions. Trading volume and the number of participating companies continue to grow.

With respect to a post-Kyoto international regime, the US continues to favour a focus on technology development and deployment rather than emissions trading. In May 2007, George Bush announced a new climate initiative to work with major emitting countries to develop a post-Kyoto policy regime.[11] The proposal is based on the principle that climate change must be addressed by fostering both energy security and economic security by accelerating the development and deployment of transformational clean energy technologies.

It is proposed that major emitters will work together to develop a long-term global goal to reduce greenhouse gasses. Each country will then work to achieve this emissions goal by establishing its own mid-term national targets and programs, based on national circumstances. The participants will develop parallel national commitments to promote key clean energy technologies.

Approaches to be explored to encourage more investment in developing nations will include low-cost financing options for clean energy projects and eliminating tariffs and other barriers to clean energy technologies and services.

The effort will build on U.S. relations with the Asia-Pacific Partnership on Clean Development and Climate and other technology and bilateral partnerships.

[11] Bush (2007), A New International Climate Change Framework, 31 May, 2007 www.whitehouse.gov/news/releases/2007/05/20070531-13.html

Australia

In a recent development, the Australian government has substantially revised its climate change strategy to support the development of an efficient domestic and international emissions trading program.[12] In doing so, it is anticipating greater influence in developing the ongoing global emissions strategy.

The revised strategy stems from the findings of the recent Prime Ministerial Task Group on Emissions Trading which were endorsed by the government on 3 June. On the global effort to manage emissions, the Task Group (TG) concluded that in the near to medium term it is likely that a global climate change response will emerge through a series of flexible national approaches. Over time, this 'patchwork' of arrangements is likely to promote linkages and connections that will have the effect of promoting harmonisation and convergence between approaches.[13]

An active Australian program of cooperation with its major trade and investment partners and key competitors is recommended by the TG that would maximise the prospects of shaping this global framework in ways that support Australia's economic and environmental objectives. Giving particular attention to the Asia–Pacific region is advocated as the way Australia could contribute positively to advancing the goal of a comprehensive global effort.

The TG recommended that Australia should adopt an emissions constraint for the period beyond 2012 and implement a domestic emissions trading scheme. It concluded that adoption of a post-2012 target – together with other policies such as emissions trading to promote flexibility and cost effectiveness – would provide an additional platform for Australia to pursue cooperation at the bilateral and regional levels.

The TG considered that the most likely scenario in the near to medium term is for a decentralised set of arrangements involving carbon trading. The building blocks of such an approach could involve:

- some countries introducing domestic trading systems based on the 'cap and trade' model
- other countries introducing a range of policies and measures with elements of a 'baseline and credit' approach or other mechanisms that would engage their private sectors in the global carbon market
- links between different trading systems, and between participants in different systems and approaches, through various formal and informal mechanisms, gradually introducing carbon pricing to a range of markets.

[12] On 3 June 2007, the Australian Prime Minister, John Howard, accepted the recommendations of his Prime Ministerial Task Group on Emissions Trading which recommended immediate action to implement a domestic emissions trading scheme. With this move the government has joined the Opposition Labor Party in seeing domestic emissions trading with international linkages as the most effective way to manage future greenhouse gas emissions.

[13] DPMC (2007), Report of the Prime Ministerial Task Group on Emissions Trading, May 2007 www.pmc.gov.au/emissionstrading

The process of knitting together these disparate national-level systems and arrangements is likely to be uneven and constrained by various political and socio-economic factors. A key issue will be the extent to which individual countries implement domestic policies that promote links and interconnections.

'Pledge and Review' proposal for APEC

In a first step to pursue Australia's new doctrine, the Howard government plans to promote a 'pledge and review' model at the Sydney APEC leaders meeting in late 2007. This model would allow countries to set their own objectives in a range of areas that effect climate change, and review their own progress. Some pledges could be quantitative (such as emissions targets or carbon taxes), others could be performance-based, for example, related to the take-up of specific technology, or energy efficiency, research and development and/or adaptation objectives. Pledges would be periodically reviewed, with the aim of promoting extra action.

The Australian government is appointing the Secretary of Foreign Affairs, Michael L'Estrange, as its special envoy to promote the 'pledge and review' initiative. Business leader Mark Johnson has also been appointed to help build support in the regional business community.

Australia's emissions trading scheme

The TG believed that a decision by Australia to introduce a domestic emissions trading scheme would help to shape a future global system. The key features of the TG's proposal are:

- a 'cap and trade' model supported by offset projects, to be operational no later than 2012.
- a long-term aspirational emissions abatement goal and associated pathways to provide an explicit guide for business investment and community engagement
- maximum practical coverage of all sources and sinks, and of all greenhouse gases including agriculture when practical issues are resolved
- a mixture of free allocation and auctioning of single-year dated emissions permits
- free allocation of permits as compensation to existing businesses likely to suffer a disproportionate loss of value or adverse trade exposure due to the introduction of a carbon price
- a 'safety valve' emissions fee designed to limit unanticipated costs to the economy and to business, particularly in the early years of the scheme, while ensuring an ongoing incentive to abate
- recognition of a wide range of credible carbon offset regimes, domestically and internationally
- capacity, over time, to link to other comparable national and regional schemes in order to provide the building blocks of a truly global emissions trading scheme
- revenue from permits and fees to be used, in the first instance, to support

emergence of low-emissions technologies and energy efficiency initiatives.

A timetable of around four years has been proposed by the TG for Australia to begin full-scale emissions trading. This involves announcement of a long-term aspirational goal and establishment of an emissions reporting and verification system in 2008; finalisation of the key design features and establishment of the legislative basis of the scheme by 2009; establishment of the first set of short-term caps and allocation of permits in 2010; and commence trading in 2011 or, at the latest, 2012.

With its new position on emissions trading, the Australian government has joined the federal Labor Party opposition in advocating emissions trading as the core of domestic and international emissions management. Regardless of who wins the forthcoming federal election in Australia, the development of a national emissions trading scheme will now proceed. The major difference would be that the Labor Party would ratify the Kyoto Protocol bringing Australia more rapidly into the international emissions market.

Asia-Pacific Partnership for Clean Development & Climate (AP6)

The Asia Pacific Partnership for Clean Development and Climate or AP6 was launched in August 2005 with a membership comprising Australia, China, India, Japan, Republic of Korea and the US. Its objective is to develop, deploy and transfer cleaner, more efficient technologies and to meet national pollution reduction, energy security and climate change concerns. [14]

Eight public-private sector AP6 Task Forces have been established covering: (1) cleaner fossil energy; (2) renewable energy and distributed generation; (3) power generation and transmission; (4) steel; (5) aluminium; (6) cement; (7) coal mining; and (8) buildings and appliances.

Each Task Force has formulated an action plan covering both immediate and medium-term actions to be implemented by the member governments.

AP6, APEC and emissions trading

It is now apparent that an emissions price signal will be needed to provide an incentive for the necessary R&D investment and adoption, in addition to the purely voluntary, technology focus of the AP6. This argument appears to have gained some traction with the Australian Government with the Prime Minister suggesting that the AP6 could provide the foundation for a new trading-based global regime.[15] This role for the AP6 is supported by the Business Council of Australia which has stated that the AP6 holds the key to developing a global market, given that its members include the world's largest current and future carbon emitters. It believes Australia should use its influence to encourage the development of a pro-forma trading market within the AP6 group, as a precursor to the development of a global market.[16]

The possible role that the AP6 could play in fostering a more effective global emissions regime is explored in the recent report of the Australian PM's Task Group on Emissions

[14] See www.dfat.gov.au/environment/climate/050728_final_vision_statement.html
[15] See www.pm.gov.au/news/speeches/speech2246.html
[16] See www.bca.com.au/DisplayFile.aspx?FileID=7

Trading.[17] The Task Group believed that there is considerable scope for enhanced cooperation with regional developing countries on technology development, building on the AP6 model. Such approaches would have the potential to span the related issues of climate change, energy security and sustainable development. They also provide a basis for identifying projects and activities that could generate credits in emissions trading schemes.

Australia and the US are also planning to canvass the idea of extending involvement in AP6 to all members of APEC as a way of strengthening the regional initiative. At the last meeting of APEC leaders in Hanoi in 2006, they instructed ministers to report at the forthcoming Sydney meeting on ways APEC might respond to the challenge of meeting rapidly growing energy demands while minimising environmental effects. Involving APEC members in the AP6, particularly if it involves a emissions trading element, could be a useful strategy.

New market structures

In working towards a new post-Kyoto policy regime, the relationship between the abatement efforts required of developed and developing countries remains the most contentious issue. The conditions under which the KP's differentiated commitments were adopted are clear – developed industrialized countries are largely responsible for the elevated levels of greenhouse gases in the atmosphere today. Equity considerations dictated that those developed industrialized countries should take the lead in abating emissions while helping to build capacity in developing countries to do the same in the future. The CDM provides a market incentive structure for developed countries to invest in abatement projects in developing countries with associated technology transfer and capacity building benefits.

These conditions continue but it is clear that if progress is to be made towards global emission control, developing countries must be brought more effectively into the emission management regime. The experience with CDM outlined above would suggest that this would be best done utilising market mechanisms and incentives but developing countries are understandably reluctant to accept inflexible binding targets.

The Pew Center has undertaken an extensive dialogue across stakeholders in developed and developing countries to determine the key elements of a future climate change regime. Their report[18] describes several "elements" or policy approaches and ways they could be linked to one another under the UNFCCC. These elements include:

- Emission targets and trading, with targets varying in form, stringency, and timing;
- Agreements negotiated across the power, automotive, or other key sectors;
- Policy-based approaches committing countries to steps advancing both climate and development objectives without binding them to fixed emission limits;
- Stronger cooperation to develop long-term "breakthrough" technologies and to deploy existing and new technologies in developing countries; and

[17] See www.pmc.gov.au/emissionstrading
[18] Pew Center, International Climate Efforts Beyond 2012, www.pewclimate.org

- New assistance to help highly vulnerable countries cope with urgent adaptation needs and support the development of comprehensive national adaptation strategies.

With emissions trading perhaps the most critical element of any future regime, Ward[19] and Jotzo & Pezzey[20] have looked at the role of emissions trading in future climate change policies – in particular how to foster wider participation through greater flexibility of commitment forms, and getting beyond the CDM project-based model for developing countries. Both studies concluded that a future policy framework does not need to be as constrained as the Kyoto Protocol in terms of how emission commitments are framed.

Flexible commitment options

Many design options have been proposed, and will figure in the negotiations on a post-2012 treaty. [15] [16] In particular:

Binding fixed emission limits could continue to be used for industrialised countries, potentially combined with price caps.

Intensity targets could link targets to future GDP levels, with indexation customized to each country's circumstances and preferences. They could reduce cost uncertainty for any country, make target commitments more acceptable, and lead to more stringent environmental commitments.

Non-binding targets could be used as entry-level commitments to draw in a limited number of risk-averse countries. Their main role would be to help break the political impasse over commitments for developing countries, as they offer an 'emergency exit'.

Sectoral targets could cover specific industrial sectors in the largest producing countries, and so help address concerns about carbon leakage to countries without national caps. For best results, sectoral targets would need to be integrated with broad-based international emissions trading.

Sector-based CDM could take the Clean Development Mechanism beyond its current confines of being project-based, and make more abatement options in developing countries available in such sectors as cement, steel and aluminium (with these sources excluded from any national or regional emission limits)

Price caps could help protect permit buying countries from overly high compliance costs, and bring greater expected benefits by reducing uncertainty.

Project-based crediting mechanism could be used to provide coverage of emission reduction/sink enhancement activities otherwise not covered.

Voluntary 'no lose' sectoral crediting baselines in sectors for which countries seek to attract major investment in clean technology consistent with national sustainable development priorities, and for which the scope of a project-based mechanism is inadequate

[19] Ward (2005), *Role of Emission Trading in Future Climate Change Policies,* www.ieta.org/ieta/www/pages/download.php?docID=1258

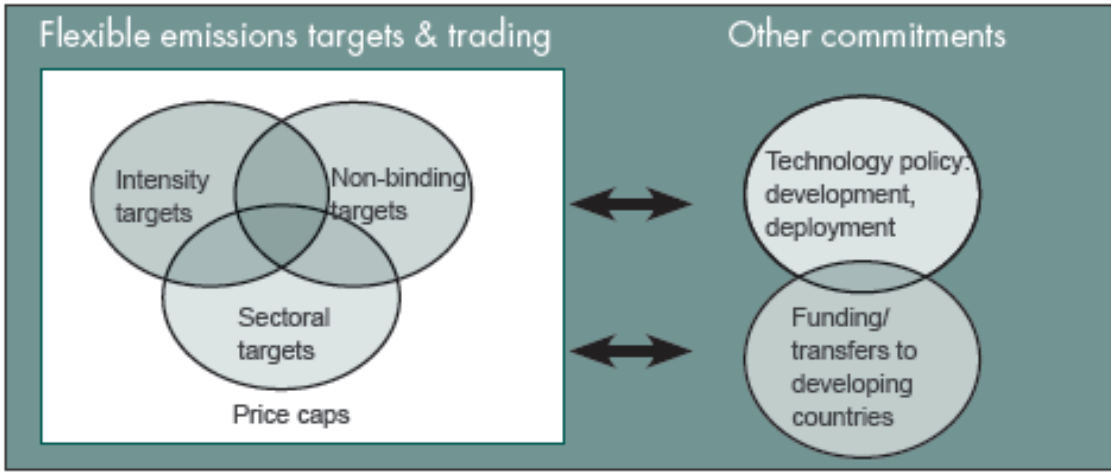
[20] Jotzo and Pezzey (2007), A Better Kyoto: options for flexible commitments, http://een.anu.edu.au ; Jotzo (2007), A Better Kyoto with Flexibility, AETF Review, Mar/Apr 2007 www.aetf.net.au

Commitments for funding of technology development, or for adaptation in poor and vulnerable countries, could be recognized alongside commitments to reduce emissions, or traded off against them. This would provide direct links to technology-focused initiatives.

Policies and measures for reducing emissions in the context of 'sustainable development' objectives could be agreed with developing country governments, and funded fully or partly by industrialised countries.

The relationships between these options as proposed by Jotzo[21] are shown in Figure 6.

Figure 6: Possible combinations of flexible commitments



Further research and cooperation

In principle, the options outlined above, or some combination of them, should provide enough flexibility to allow most countries to tailor commitments to suit their level of development, resource endowments, and other national circumstances, while at the same time transmitting an international price signal to key emitting sectors.[16]

To support the evolving policy and market frameworks there is also a need for developed countries to facilitate a more extensive program of R&D, technology transfer, capacity building and investment in best practice projects in the developing world. Relevant technologies include renewable energy, carbon sequestration and energy efficiency. Element of such a program could include low-cost financing, removal of trade barriers, and making relevant intellectual property available to developing countries on preferential terms.[22]

In accordance with the above principles, further research and cooperation is needed to:

i) establish in more specific terms how these options can be applied to particular countries.

[21] Jotzo (2007), A Better Kyoto with Flexibility, AETF Review, Mar/Apr 2007 www.aetf.net.au

[22] Summers, L. (2007), Practical Steps to Climate Control, http://economistsview.typepad.com/economistsview/2007/05/larry_summers_p.html

ii) examine the role that regional groupings such as APEC and AP6 can play in regional and international market development

iii) determine how national and regional commitments can be incorporated into a negotiated multilateral policy and market framework.

iv) foster supporting cooperation and investment in R&D, technology transfer, and capacity building with developing country partners.

Thresholds and graduation schemes need to be developed as a guide to what commitments particular countries or combinations of countries could be expected to take, based on indicators such as income and emissions per capita. PECC would be well placed to foster such research and cooperation for the critical Asia-Pacific region and thereby make a significant contribution to the global policy development effort.

Conclusions

The management of the environmental impacts of Asia-Pacific energy use is an issue of global significance. A market based multilateral approach is being tested through the Kyoto Protocol's CDM and the EU ETS, and responses are encouraging both in terms of technical innovation and capital market response. The question remains, however, can the CDM and other market mechanisms evolve to provide the basis for an effective, comprehensive long-term policy regime beyond Kyoto?

Few would dispute now that market mechanisms need to play a key role in future emission management. But to broaden and deepen the nascent international emissions market to encompass a wider range of countries will require a more flexible array of commitment types to better allow for particular national circumstances. To support these evolving policy and market frameworks there is also a need for developed countries to facilitate a more extensive program of R&D, technology transfer, capacity building and investment in best practice projects in the developing world.

Developing and testing such new market structures and cooperative programs needs to be facilitated by well researched and managed regional initiatives, perhaps utilising such existing groupings and APEC and the AP6. PECC is well placed to explore and foster such initiatives for the critical Asia-Pacific region.