



Review of Carbon Markets

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About the 'Breaking the Climate Deadlock' Initiative

'Breaking the Climate Deadlock' is an initiative of former UK Prime Minister Tony Blair and independent not-for-profit organisation, The Climate Group. Its objective is to build decisive political support for a post-2012 international climate change agreement in the lead up to the 2009 UN Climate Change Conference in Copenhagen. Its particular focus is on the political and business leaders from the world's largest economies, particularly the G8 and the major developing countries. The initiative builds on Mr Blair's international leadership and advocacy of climate change action while in office, and The Climate Group's expertise in building climate action programmes amongst business and political communities.

This briefing paper and its companions were commissioned by the Office of Tony Blair and The Climate Group to support the first Breaking the Climate Deadlock Report – 'A Global Deal for Our Low Carbon Future' – launched in Tokyo on June 27th 2008. Written by renowned international experts and widely reviewed, the papers' purpose is to inform the ongoing initiative itself and provide detailed but accessible overviews of the main issues and themes underpinning negotiations towards a comprehensive post-2012 international climate change agreement. They are an important and accessible resource for political and business leaders, climate change professionals, and anyone wanting to understand more fully, the key issues shaping the international climate change debate today.

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For further information see: www.breakingtheclimatedeadlock.com

Executive Summary

Putting a Price on Carbon

- Carbon markets and emissions trading schemes have a key role to play in helping to achieve the required scale of reductions in global emissions over the coming decades. They put a price on carbon which helps stimulate abatement and drive investment in low carbon technologies and services.

Achieving Scale

- Much has been achieved since the Kyoto rules were elaborated and agreed. Trading schemes have been implemented in key countries and regions and the market for carbon instruments has grown rapidly. In 2007, the EU Emissions Trading Scheme (EU ETS), which covers more than 40 percent of the EU's total emissions, achieved a traded value of \$50 billion. The primary Clean Development Mechanism (CDM) market is valued at \$7.4 billion, and is also generating a fast-growing secondary market. Elsewhere, many national and local compliance schemes are planned or under development. In addition, "environmentally aware consumers" are driving growth in the voluntary carbon market.
- The key issue is whether these new markets are capable of delivering the scale of required investment and abatement activity.
- As with any market, carbon markets need to have depth, breadth, liquidity and transparency if they are to be fully effective. In addition, because carbon instruments are commodities created by intergovernmental agreements and by national or local government policies, they need long-term policy visibility and stability.
- Measured against these criteria, the existing and planned carbon markets have some way to go. A central issue is the question of scale.

Towards a Global Carbon Market

- The "sum of the parts" of the carbon markets today may not deliver the deep cuts in emissions that are required. Many "domestic" emissions trading schemes have "self-protection" features that mean they are not as open or international as the architects of Kyoto had in mind, or as many experts in the field would recommend.
- A comprehensive post-2012 global agreement could re-open the door for domestic ETS schemes to develop in a more open fashion – with rules and currencies that have more in common. Having effective carbon market structures in place internationally would help limit the debate about what is the "right" price, as the market will provide efficient price signals consistent with the overall emissions goal.
- In developing countries, investment in emissions reductions has been held back by the project-by-project approach, constraints over institutional capacity, and the difficulty in applying additionality within the CDM. Sectoral or programmatic approaches could broaden the scope of the CDM, but alternative approaches such as sectoral no-lose targets may be required to fully engage more countries and sectors.
- The adequacy of institutional capacity at both national and international levels is central to the success of the carbon market. Key roles include setting targets, approving projects and overseeing monitoring requirements. Harmonisation of institutional arrangements will also help the market operate efficiently and effectively. Proposed sector-based approaches, or the linking of emissions trading schemes, will require greater institutional capacity and cooperation.

Just a Part of the Solution

- Finally, emissions trading is just one of the necessary tools in the climate change mitigation toolkit. Carbon price signals cannot in practice be expected to effectively "dig out" all mitigation opportunities. Nor can they necessarily provide the "pull" to bring forward all the technologies required for deep global emissions reduction. Other policies and measures are needed within an overall sustainable development agenda that addresses climate security, as well as food, water, energy and other "securities".

Potential Deliverables

- By industrialized countries: a re-direction of the evolution of domestic (entity-level) emissions trading schemes towards an open and efficient global market with common rules and currencies.
- By developing countries: a significant step beyond project-based mechanisms to sector-based approaches that are capable of mobilising the required scale of investment in low carbon technologies and practices.
- By all countries: resourcing the necessary levels of institutional capacity building required to achieve these outcomes.

Recommendations

a) Decisions required from leaders this year:

- Provide confidence in the longevity of the carbon market and through that encourage abatement and low carbon investment. Agree on (or at least signal) long term targets to 2050 and a credible trajectory to achieving these.
- Direct more intensive work efforts by policymakers and experts on means to achieve open and efficient global carbon markets. This should go beyond efforts to understand how to link domestic emissions trading programs, and address concerns about securing environmental outcomes, equity and competitiveness. A key step will be to develop new carbon market policy instruments for developing countries that move beyond the CDM framework.

b) Decisions required by Copenhagen (December 2009):

- Agree mid-term targets for industrialised countries and the mechanisms for achieving these targets.
- Establish the framework for an efficient global carbon market that allows open trading between cap-and-trade schemes and removes limits on offset schemes based in developing countries.
- Decide on the future of the project-based approach and agree sectoral targets in relevant developing countries. Agree funding to build capacity within developing countries and the institutions required to manage the project- or sector-based approaches.

Review of Carbon Markets

This paper provides a brief introduction and overview of the carbon markets, identifies their impact, assesses their success as functional markets and considers the potential issues faced by governments and policy makers in moving towards a global carbon market.

[Introduction to carbon markets and emissions trading](#)

Carbon markets operate on the basic principle of supply and demand, which establishes a “price of carbon”. Emissions trading schemes set the rules and regulations that govern trading in the market. Economic efficiency and environmental effectiveness are hallmarks of carbon markets and emissions trading.

[Carbon markets and emissions trading: how they work](#)

Like a market for any other traded commodity, carbon markets represent all the ways in which carbon units (the commodity) are bought and sold. Beyond this basic trading function, the critical importance of “the market” is that it reveals the “price of carbon”. As with other traded commodities, this price fluctuates as a result of expectations of the supply and demand, in this case for the right to produce emissions. The supply and demand dynamic is initially determined by the imposition of an emissions cap by a central authority (this could be at a global, regional or national level). Trading rules and regulations (i.e. an emissions trading scheme) then determines how the market functions in practice.

Cap-and-trade schemes

The most common form of emissions trading scheme is a “cap-and-trade” system. In such schemes the regulator sets an overall limit on emissions from a defined group of greenhouse gas (GHG) emitters, allocates a fixed number of allowances across these emitters, and then allows market participants to decide whether to meet their targets by reducing their own emissions or by buying allowances on the open market.

In theory this flexibility means that the emissions reductions are achieved at the lowest possible cost, as it encourages those who find it cheaper to cut their own emissions to do so, and make money by selling any surplus credits. The overall cap will determine the underlying scarcity in the system and this, in turn, will strongly impact the price (or value) of carbon. Assuming reasonable liquidity, this process should create an efficient and cost-effective mechanism for the reduction of emissions.

This approach, which was pioneered by the sulphur dioxide (SO₂) market in the US, is well suited to greenhouse gas (GHG) management, as these gases have a global rather than local impact, and there are many different opportunities for companies to reduce them. That said, such markets require robust monitoring, verification and reporting protocols to establish both baseline data and ongoing performance, and there must also be credible penalties for non-compliance, if total emissions are to stay within the overall cap.

Project-based offset mechanisms

Most emissions trading schemes (either existing or proposed) allow participants to meet their emissions obligations through the use of “offset” credits generated by projects¹ in sectors or countries not covered by the schemes’ caps. A project-based credit represents an emissions reduction (equivalent to a tonne of CO₂ (or tCO₂e) abated) below a baseline target.

The Kyoto Protocol’s Clean Development Mechanism (CDM) and Joint Implementation (JI) process are both examples of project-based mechanisms. The CDM is designed to assist developing countries in achieving sustainable development by permitting industrialised countries to finance GHG emissions reduction projects in developing countries in return for offset credits. JI works in a similar fashion, except the projects are between two developed countries.

The benefits of project-based mechanisms include: increased supply of credits (thus reducing costs of compliance); environmental effectiveness² (because mitigation action has taken place that would not have occurred otherwise); technology diffusion; and support for sustainable development.

The benefits of carbon markets and emissions trading

The benefits of carbon markets and emissions trading include:

- Guarantee of environmental outcome, assuming proper design and enforcement³
- Lower costs of compliance for all obligated emitters – in aggregate and individually – while the decision about whether to trade is left to emitters
- The opportunity for emitters to profit by over-complying with their set targets
- The requirement that emitters measure, report and verify their emissions and so consciously consider whether it is cheaper to abate or buy emission units
- The creation of price signals, which are crucial in helping emitters decide when to abate and when to buy
- The requirement that businesses take into account potential carbon liabilities when making investment decisions
- Support for sustainable development through funding of emission abatement projects in developing countries in return for offset credits

Emissions trading therefore causes both technical and financial managers to pay closer attention to controlling emissions than would be the case if they were required simply to use a particular control technology or pay an emissions fee (i.e. a “carbon tax”). It thus leads to a management dynamic, driven by a cost saving imperative that is more innovative and opportunity-seeking.

The current state of the carbon markets

The emergence and growth of a market for carbon and emissions trading schemes is perhaps the most visible result of worldwide efforts to mitigate climate change. Carbon markets can be divided into compliance markets and voluntary markets. These markets are increasingly supported by a growing range of financial institutions and instruments, reflecting the emergence of carbon as a mainstream commodity.

Compliance markets

Compliance markets emerged following the elaboration and agreement of emissions trading rules under the Kyoto Protocol, during UN climate change negotiations in Marrakech in 2001⁴. They generally consist of a cap-and-trade emissions trading scheme complemented by project-based mechanisms.

Emissions trading schemes

The largest and most high-profile compliance market is the EU Emissions Trading Scheme (EU ETS), which is a classic cap-and-trade mechanism. The scheme covers over 11,000 energy-intensive installations, which account for over 40 percent of the EU's CO₂ emissions. The total traded volume of EU allowances (EUAs) in 2007 amounted to around two billion tCO₂e, with a market value of approximately \$50 billion, representing about three-quarters of the total value of carbon markets world-wide.

Exhibit 1 lists the other compliance markets in operation or under development around the world. At present, these markets operate (or will operate) largely independent of each other due to differences in regulations and units of trade (amongst other things). This lack of compatibility reduces overall economic efficiency as well as global environmental effectiveness. Formally linking these schemes is one of the key policy challenges facing governments.

Existing Schemes	Year Established & Commitment Period	Coverage	
		Gases	Sectors
European Union Emissions Trading Scheme (EU-ETS)	Phase I: 2005-2007 Phase II: 2008-2012 Phase III: 2012-2020	Only CO ₂ at present	Power, steel, cement, refining, ceramics, lime and glass sector combustion installations in many other sectors
New South Wales Greenhouse Gas Abatement Scheme (GGAS)	2003, Annual	All six GHG	Power sector
Proposed Schemes⁵			
US states' Regional Greenhouse Gas Initiative (RGGI)	Starts 2009	CO ₂	Electricity generators; coal, oil and gas fired power generation >25MW
Australia Federal Greenhouse Gas Emissions Trading Scheme	Starts 2010, Annual	All GHG	Large facilities (above 25ktCO ₂ e/year)
New Zealand Emissions Trading Scheme (NZ ETS)	Starts 2008 for forestry subject to legislation approval, Other sectors gradually included starting 2010	All GHG	All emitting sectors. Staggered inclusion of forestry, liquid fossil fuels, stationary energy, industrial process, agriculture, and waste from 1 Jan 2008 through to 1 Jan 2013.
Assembly Bill 32 (AB32), California	Starts 2012	All GHG	Major industries including transport, electricity and natural gas
Canada Emissions Trading Scheme	Starts 2010	All GHG	Heavy industries (50% of emissions) including electricity generation, oil and gas
US states' Western Climate Initiative Cap-and-Trade Program (Draft plans)	Varies by state	All GHG	Sources under consideration: industrial and commercial sources, transportation fuels, residential and commercial fuel combustion
US Lieberman-Warner	Proposed start 2012	All GHG	Economy wide (84% of GHG emissions)
US Bingaman-Specter	Proposed start 2012	All GHG	Economy wide (86% of GHG emissions)

Project-based mechanisms

Certified Emission Reductions (CERs)⁶ generated by the CDM are the most common type of project-based carbon credits, and a few countries (Brazil, India and China) currently dominate the supply. In the absence of a global carbon market, CERs have also assumed a de facto role as a linking mechanism between schemes as they are one of the few units generally accepted in all carbon markets. This has also meant that CERs have effectively become the closest proxy for an international price of carbon.

The primary CDM market generated 551 million tCO₂e of credits worth \$7.4 billion in 2007, while trading in the secondary CDM market exploded in 2007, with volumes traded rising tenfold to 240 million tCO₂e, or \$5.5 billion. The volume and trading of JI credits – known as Emission Reduction Units or ERUs – is much lower. In 2007, 41 million tCO₂e of ERUs were transacted with the estimated market value of around \$495 million.

Despite the success of these project-based mechanisms, the very fact that the credits are generated by individual projects can lead to constraints in supply in the primary market.

Increasing financial sophistication

The emergence of carbon markets as mainstream commodity markets is reflected in the increasing participation of financial players and the proliferation of financial instruments. Clear evidence of the increasing commoditisation of carbon credits is seen in the establishment of exchanges such as the European Climate Exchange (ECX) and Nordpool, and the launch of BlueNext, the Montreal Climate Exchange (MCeX) and the New Zealand TZ1.

The major financial institutions have also moved decisively into the carbon market space. Many are large buyers of carbon credits in their own right, but are also developing and trading increasingly sophisticated financial instruments to other market players. Forward purchase contracts, carbon delivery guarantees, swaps between CERs and EUAs, and carbon-linked bond transactions are already available, and more will emerge.

