GREENHOUSE GAS MARKET
2011
Asia and Beyond: the Roadmap to Global Carbon & Energy Markets

Asia and Beyond:
the Roadmap to Global Carbon & Energy Markets

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Acknowledgements:
IETA expresses its gratitude to all the authors for their contributions and all those who worked on the publication.

Special thanks to:
Clayton Munnings and Elisabeth Adam

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Introduction

Message from the President

The focus of IETA’s 2011 compendium of essays and reports on the Greenhouse Gas Market report is the Asia-Pacific Region. As we go to press, the Australian House of Representatives has just passed the package of Energy and Climate Bills that contain Australia’s comprehensive and carefully-designed emissions trading system, a worthy partner to the EUETS, the US North Eastern States’ RGGI system, the New Zealand system and the imminent California system. While climate and carbon pricing by any means have proved to be highly politically volatile in Australia, the progress being made there shows that cap and trade is shaking off the disappointments in Washington last year and the political and economic impact of recession in Europe and elsewhere, and is back on the world stage with a vengeance.

We do not yet know how the news from Australia will reverberate across the Asia-Pacific region. But there are many places in Asia where progress has been slowed by a feeling that, with the exception of Europe, there was declining international political sympathy for cap and trade, and politicians and lobbyists who promoted it would have a hard time. However the intensive study, conducted by many Asian Governments over many years, of the impact of the EUETS and other existing schemes has produced a cadre of officials and opinion-formers sympathetic to this policy tool. Evidence of wider international use of trading strengthens their position. And as it has become more acceptable to acknowledge that countries other than the UN Annex I list should take quantified action against climate change, the tool is being picked up ready for use.

Just in time. Because there is a creeping malaise about emissions trading in the continent of its birth as a climate change policy tool. The EUETS has suffered from a whole series of unfortunate problems with security, tax frauds and the price impact of recessionary conditions, none of which impact on the effectiveness or importance of emissions trading as a policy, but all of which are used by opponents of trading, and advocates of different approaches such as direct and inflexible regulation, to give the impression to those who are not experts in the EUETS that something is wrong with it. The very idea of offsetting compliance obligations with purchased emissions reductions is under attack again, despite the fact that economists have shown again and again that global trade in emissions reductions on a substantial scale is necessary to combat climate change at acceptable cost. Problems with, or just scare stories about, the Clean Development Mechanism have been used to justify severe limits on its use. And there is little current appetite for levels of ambition in the EU’s reduction targets that could stimulate the market to continue its work of price-discovery and cost minimization. Low prices resulting from this relative lack of ambition are then used as the justification for proposals that would radically alter or thoughtlessly impact upon the EUETS.

The interest in cap and trade as a tool of domestic policy is also just in time for another reason involving Europe as well: the old model of Asian economies providing the bulk of emissions reduction projects for use in the European compliance system is about to come to a halt. While Asia has its share of the Least Developed Countries who seem to be the only sources of new offset tonnes acceptable in Phase 3 of the EUETS, most of the seasoned providers of project-based reductions are having to look for new markets. In three years’ time, it looks as though Australia will definitely be one of them. It may take a similar period, or longer, for new Asian domestic trading schemes to take on project reductions within the country of the scheme, or from the near-abroad or further afield, but it is clear that the idea is under discussion in some influential circles. For the next few years, however, as European demand slows down and becomes more choosy and while developments in other countries are still awaited, expect some difficult times even though there will be areas of continued growth, in particular the voluntary market.

The greenhouse gas market across the world waits for, and attempts to contribute to, the development of new market mechanisms on the UN stage. There is much that could be done to create systems that would be truly capable of the scaling-up from the CDM that so many commentators have called for over so long a period. But these developments, like many others in the international climate change negotiations, are caught in the intricate web of negotiating issues for which there still seems to be no end in sight. And scaled-up supply needs scaled-up demand, too, in order to achieve anything.
In this edition of IETA’s Greenhouse Gas Market report, authors from within and outside IETA’s membership pick out issues that they think will be particularly important for the development of the market in the year or years ahead. Though starting from an Asia-Pacific perspective, the report wends its way through national situation reports, updates on policies complementary to trading, interfaces between trading and other international policies and developments, and aspects of the trading and climate change agendas that need to be developed or re-thought - as the reality of living in a different, more fragmented, but still dynamic, greenhouse gas market comes closer.

Henry Derwent
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1. Introduction
After failing three times to successfully pass an Emissions Trading Scheme (ETS) during the last Parliament, a minority Labor Government looks set to finally pass a national carbon pricing scheme in Australia later this year with the support of The Greens and key independents.

The scheme is scheduled to commence in July 2012, initially covering around 500 large emitters in all sectors other than land-use and agriculture (with some exceptions). After a three year period with a fixed price, starting at AU$23/tC02e, the scheme will transition to market-set prices and is, based on current modelling, likely to include considerable demand for international carbon credits. The introduction of a carbon price is part of a broader policy package that includes a range of complementary policies and major tax cuts targeted at low and middle income households to alleviate cost increases from the carbon price.

However, with public opinion markedly against the introduction of carbon pricing, a razor thin Government majority, and an extraordinarily vehement campaign against the scheme by the conservative Liberal/National Party Coalition (L/NP) in opposition, uncertainty still looms large as to the future of carbon pricing in Australia.

2. A long and Winding Road
The path toward carbon pricing in Australia has been particularly tortuous, even by international standards. During the eleven years of Federal L/NP rule prior to 2007, explicit carbon pricing policies were pursued only by State Labor Governments. Their efforts included an innovative, yet highly problematic state-based scheme in New South Wales – GGAS, which began in 2003 – and a state-government-led national ETS design process. Growing public and industry pressure on the issue, however, saw both the ruling L/NP and Labor opposition commit to the introduction of emissions trading prior to the 2007 Federal election.

The new Federal Labor Government’s efforts to pass a broad-reaching ETS in cooperation with the L/NP, the Carbon Pollution Reduction Scheme (CPRS), were derailed in 2010 when the conservative opposition’s leader was replaced by one less amenable to emissions trading. Prime Minister Kevin Rudd’s subsequent decision to defer the CPRS until at least 2012 seems likely to have contributed to the precipitous decline in his popularity that eventually saw him replaced by his deputy, Julia Gillard.

The 2010 federal election saw the conservatives under their new leader, Tony Abbott, reverse their previous support of emissions trading and actively campaign against it, while Labor appeared to have little interest in advocating its CPRS. Amidst dwindling public support, the politics of carbon pricing were also influenced by three state elections, which saw Labor governments that supported carbon pricing replaced by conservative governments that didn’t.

The federal election delivered a hung Parliament, and it was only after protracted negotiations that Labor was able to form a minority Government with the support of The Greens – who now held the balance of power in the upper house – and three Independents from the lower house. Two of these Independents – both from regional electorates – joined members of Labor and The Greens in a Multi-Party Climate Change Committee (MPCCC). The L/NP, however, declined an offer to join this committee. The aim of the MPCCC was to explore the options for implementing a carbon price in Australia and was one of the main input mechanisms for providing a new climate policy package.

3. The Clean Energy Future Policy Package
The culmination of the MPCCC process was the Government’s July 2011 announcement of the Clean Energy Future (CEF) package. The policy package is more broadly scoped in terms of policy than the previous CPRS, and contains a number of distinctive features that distinguish it not only from its predecessor, but also other carbon pricing schemes around the world such as the EU ETS.

Fixed to Flexible Price Transition
The centrepiece of the CEF package is an ETS, beginning on July 1, 2012 (the start of the Australian financial year). However, unlike the EU ETS or the original version of the CPRS, for the first three years the carbon price will be fixed: beginning at AU$23 per tonne of CO2-e, and rising at 5% (nominal) per year.

From July 1, 2015, the price becomes market-set. The emissions caps for this latter period are to be announced in 2014 and then set five years in advance. Also, unlike the EU ETS, there will be an initial price ceiling of AU$20/tCO2-e above the expected international price, and a price floor of AU$15/
Summary of Clean Energy Future Policy Package

- AU$23/tCO2-e fixed price start (1 July 2012) rising by 5% (nominal) per annum before an emissions trading scheme starts on 1 July 2015.
- Emissions reduction targets of 5% by 2020 and 80% by 2050 on 2000 levels.
- Approximately 60% coverage of Australian emissions in stationary energy, industrial process, (new) waste and fugitive emissions.
- Agriculture not covered. Credits from the Carbon Farming Initiative may be used within the scheme.
- Transport only partially covered.
- Households compensated for cost increases through the tax and welfare system to fully and partially offset increases in costs.
- AU$9.2 billion in industry compensation, mainly for industries exposed to international trade (e.g. steel, coal, and gas). To be reduced over time and subject to review.
- A Clean Energy Regulator will administer the scheme.
- An independent Climate Change Authority to advise the Government on emissions targets and report annually.
- The Productivity Commission will review compensation packages.
- A Clean Energy Finance Corporation will invest AU$10 billion in ‘clean’ energy, with at least 50% of investment to go to renewable energy.

Though the scheme uses an emissions trading architecture, its operational similarity to a tax during the fixed-price period was immediately pounced upon by opponents of the scheme as being a betrayal of the Government’s election promise not to introduce a carbon tax. The Government has battled this criticism ever since.

Targets
The 2020 national emissions target remains the same as had been agreed to by both Labor and the L/NP before the 2009 Copenhagen climate conference: 5% below 2000 levels by 2020, strengthening to 15% or 25% dependant on international action. The ETS cap will be set in accordance with this national target, taking voluntary action into account.

Under the strong economic growth projections by the Australian Treasury over this period, the 5% target represents a 23% reduction on business-as-usual levels. However, the current extraordinary uncertainty about growth prospects for economies around the world suggests some caution be applied to such estimates.

A new feature of the CEF is that the Government has committed to an 80% emissions reduction target by 2050. This aligns Australia more closely with the ambitious commitments of countries such as the UK and Germany.

Coverage
The main sectors covered by the ETS will be stationary energy, industrial processes, fugitive emissions (primarily from coal mining and gas extraction), and emissions from non-legacy waste. The transport sector is to be partially covered: household transport fuels, light vehicle business transport, and off-road fuel use by the agriculture, forestry, and fishing industries will be excluded from the ETS, but domestic aviation, shipping, rail transport, and non-transport fuels will face equivalent carbon prices through fuel tax (excise) adjustments.

60% of Australia’s emissions are thus covered directly, and roughly two-thirds indirectly (e.g. through fuel excise changes). Roughly 500 companies – those with facilities that have direct greenhouse gas emissions of 25,000 tCO2-e a year or more – are likely to be directly liable. Agricultural emissions, which form roughly 15% of Australia’s total emissions, will be exempt, as are emissions from forestry and land-use change.

Carbon Unit Allocation
Unlike the first two phases of the EU ETS, the Australian scheme will sell the majority of its permits – officially called “carbon units” – from the outset (initially at a fixed price and then via auction) rather than grandfather them. Approximately one third of permits will be administratively allocated as part of industry assistance measures (see below). Unlimited banking and limited borrowing (up to 5% of liability) of permits is planned.

International and Domestic Offsets
Another interesting feature of the scheme is the considerable allowance for use of international and domestic offsets compared with some other schemes. While no foreign credits will be accepted during the fixed price period, up to 50% of a party’s obligation during the variable price period may be sourced internationally (though this is down from unlimited permit imports under the CPRS). Kyoto-compliant credits created under Australia’s “Carbon Farming Initiative” can be used for up to 5% of compliance during the fixed price period and without restriction afterward.

A consequence of this use of offsets is that, over the 2020 period, approximately half of the planned emissions reductions are projected to come from overseas offsets. The CEF package regards CERs, ERUs, and RMUs as acceptable international credits, while the Government may allow or disallow other types of international units based on the advice of the CCA.
Industry Assistance
Many industries covered by the ETS will receive some form of Government assistance. A Jobs and Competitiveness Program (AU$9.2 billion) will be made available for the most emissions-intensive trade-exposed sectors (primarily manufacturing and heavy industry), with a Clean Technology Program (AU$1.2 billion) for less emissions-intensive sectors such as food manufacturers, metal forging, and foundry industries.1 The CEF package also includes assistance for small businesses and supply chains, and the Government is planning additional AU$1.6 billion in assistance for the coal and steel sectors (in addition to the assistance provided to these sectors through the CEF).

Most assistance will be in the form of administratively allocated permits, the rest in grants. Emission-intensive trade-exposed industries will receive the bulk of these ‘free’ permits – 66%-94.5% of their requirements, depending on exposure – along with the LNG industry (50% of requirements). Base-line for the free permits will be historic industry average level of emissions per unit of production.

The CEF package also includes an Energy Security Fund, which will tender for bids to shut down 2000MW of highly emissions-intensive coal-fired power by 2020. The Fund will also offer transitional assistance of AU$5.5 billion, in the form of free permits and cash, to (coal) power generators facing significant asset loss. An Energy Security Council will advise the Government on emerging risks to energy security.

Household Compensation
A stand-out feature of the policy package is the detailed attention given to ensuring low and middle income households are completely compensated for the projected costs of the carbon price. No other operating ETS to date includes household compensation of this depth. The compensation is due to more limited grandfathering of allowances (and hence more permit revenue available for redistribution) and greater public interest and concern about price impacts than that which appears to have been seen under other ETSs, notably the EU ETS.

The actual average increase in household costs from pricing CO₂-e has been modelled by Treasury at a relatively modest AU$10 per week (median gross household income in 2009-10 was AU$1320 per week). Nevertheless, the Government has ensured that an average compensation for households of an equal or higher amount will be provided. This is achieved, in part, by trebling the personal tax-free thresholds to AU$18,200, rising to AU$19,400 in 2015 (see table, below). There are also increases to various forms of welfare, such as the pension, pension supplements for self-funded retirees, and child benefit payments. With the various household compensation and industry assistance measures, the CEF will not be revenue neutral, as was originally planned, instead costing AU$4 billion over the first four years.

<table>
<thead>
<tr>
<th>Personal Income Tax Thresholds, Current and Proposed</th>
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</thead>
<tbody>
<tr>
<td>Current 2012-2013 2015-16</td>
</tr>
<tr>
<td>Threshold</td>
</tr>
<tr>
<td>AU$6,001</td>
</tr>
<tr>
<td>AU$19,401</td>
</tr>
<tr>
<td>AU$37,001</td>
</tr>
<tr>
<td>AU$80,001</td>
</tr>
<tr>
<td>AU$80,001</td>
</tr>
<tr>
<td>AU$180,001</td>
</tr>
</tbody>
</table>

Table interpretation: The tax-free threshold will be raised, benefiting low- and middle-income earners. An increase in the marginal rates of the lowest two brackets means the benefit will be limited to those earning less than $60,000 p.a.

Governance
The CEF contains much more attention to the governance of the scheme than the CPRS. An independent Climate Change Authority (CCA), in many ways similar to the UK Committee on Climate Change, will be established to report on all aspects of the scheme (including the price floor and ceiling) and to recommend targets and emissions caps. The CCAs recommendations are not binding on the Government of the day,

1 Specifically, the Jobs and Competitiveness Program covers: Primary metal and metal products; non-metallic mineral products; Pulp, paper and converted paper products; petroleum and coal products; basic chemicals and chemical products.
2 Clean Technology Program covers: Wood products; food products; printing; polymer products and rubber; beverage and tobacco products; transport equipment; furniture and other; textile, leather, clothing, footwear; fabricated metal products; machinery and equipment.
but the Government must justify any difference between its legislation and the recommendations. There is also stronger independent regulation and management of the scheme than was proposed under the CPRS, with a new Clean Energy Regulator and reviews by the (already existing) Productivity Commission. The Productivity Commission, an independent microeconomic policy and regulation review body, will review industry compensation and assistance (in particular to emissions-intensive and trade-exposed industries), fuel taxation arrangements, and foreign action; the Clean Energy Regulator will combine administration of the Carbon Pricing Mechanism (ETS), Carbon Farming Initiative, Renewable Energy Target, and National Greenhouse and Energy Reporting System.

**Renewable Energy Support**

The CEF is also a broader package than the earlier CPRS in focussing on complementary mechanisms to encourage and support low carbon technologies. This was apparently particularly due to the influence of The Greens in the negotiations of the package.

The CEF package will establish a Clean Energy Finance Corporation to invest (via loans or equity) AU$5 billion in renewable energy technologies, and AU$5 billion in low-pollution and energy efficiency technologies (which may include renewable energy projects). The Corporation will not invest in carbon capture and storage technology, though this is still supported by existing programs.

The Government will also establish an Australian Renewable Energy Agency (ARENA), which will provide grant-based funding for renewable energy projects. ARENA largely brings together existing programs under one organisation, which should result in more coordinated and consistent operation of these programs. Both ARENA and the Clean Energy Finance Corporation will be independent agencies.

Australia’s Renewable Energy Target remains at 20% by 2020. (Currently 8% of Australia’s electricity is renewable; gas accounts for 16% and coal 75%).

**4. Political Battlegrounds and Future Outlook**

An interesting aspect of the Australian political debate, compared with other countries, is that it is ostensibly not about the goal of abatement – both major parties have agreed to a minimum 5% emission reduction target for 2020 – but, instead, the best mechanism by which to do so. A number of industry, NGO, and academic stakeholders have argued that the CEF package is superior to the highly compromised CPRS in addressing both efficiency and equity considerations associated with pricing carbon, whilst acknowledging the key role of other climate and energy policy mechanisms.

The conservative L/NP’s proposed emissions reductions mechanism is so-called ‘direct action’, to contrast with the Government’s approach framed around carbon pricing and complementary policies. This ‘direct action’ would mainly comprise of setting up a government fund (from the general budget) to tender for emissions reductions from certain sectors. The proposal also relies on major emissions reductions from soil carbon sequestration. At its heart is the question of why the public should pay a price on all emissions rather than just a price on emission reductions – and the lowest cost emissions reductions at that. However, some industry and academic commentators project that the plan will either be much more expensive than the CEF approach, or, since the Opposition has promised to have a funding limit, greatly underachieve the 5% reduction target. Australian Treasury modelling released in September 2011 stated that “forgoing cheaper, internationally source abatement” – as the L/NP’s ‘direct action’ plan does – “would roughly double the economic cost of achieving the 2020 emission reduction target through a carbon price mechanism.” At present, there is little detail on how this ‘direct action’ will be funded and what distributional effects it may have.

The public debate – as reflected in the media – has seen little discussion of the comparative merits of these two approaches. Instead, the focus has been on the climate science itself, and whether Australia should act on climate change ‘ahead’ of other countries; a perhaps surprising concern, given Australia’s unfortunate lead in developed-world per capita emissions and emissions growth over recent years. Some media have given particular prominence to climate change denial and the futility of supposedly ‘going it alone’. The decline in Australian public support for carbon pricing over the past few years has certainly been marked.

At present, the Government has sufficient support to pass the policy package through both Houses of Parliament, with a vote expected by the end of 2011. If the Government manages to retain its slim hold on power, the next Federal election need not be held until late 2013. Even if the L/NP were to attain power then, the Senate might not see a change in the balance of power before 2015, by which time the CEF scheme will have been operating for several years, and business and the public might have formed a more favourable view of its impact.

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Despite the high costs of abolishing the CEF scheme – estimated by the L/NP’s own internal documents as AU$27 billion – and the effects it would have on investment decision making, the current opposition leader, Tony Abbott, has said that “I have staked my political life, what’s left of it, on stopping this carbon tax”, and the conservatives have explicitly pledged to repeal it if they attain power. Thus, uncertainty is likely to remain as to whether Australia’s recent progress toward a carbon pricing scheme will prove a major step on the path to a low carbon economy, a misstep that ends up damaging public support and consensus on climate change action, or yet another side step as the window for effective action on climate change in Australia and globally continues to narrow.

The Centre for Energy and Environmental Markets (CEEM) at the University of New South Wales, Australia, undertakes interdisciplinary research in the design, analysis, and performance of energy and environmental markets and their associated policy frameworks.
New Zealand’s Emissions Trading Scheme has been operating since 2008 and has just been through an intensive review process that examined results and set the direction for the future. The results – which are outlined in this article – provide initial signs of success in reducing emissions, stimulating clean energy investment and reversing deforestation. In an environment where many politicians are turning away from emissions trading, New Zealand’s success and its ongoing commitment to an ETS provide a lesson as to how, with the right implementation and political will, well designed trading schemes can and do deliver cost-effective results.

Background on the NZ ETS

New Zealand’s Emissions Trading Scheme (ETS) is its primary policy mechanism for reducing emissions. The scheme began operation in 2008 with the inclusion of the forestry sector. Key features of the Scheme include:

- It will ultimately cover all sectors and all gases. So far, it covers forestry and SEIP - stationary energy, transport fuels and industrial processes. It will be expanded to cover waste and synthetic gases in 2013 and agriculture in 2015. Of the sectors currently covered the SEIP sectors have been covered by the scheme since 1 July 2010, so there is only 1 year of data for these sectors following their introduction to the Scheme.
- The national traded unit is a New Zealand Unit (NZU);
- There are limited free up-front allocations (equivalent to 100% auctioning) and free allocations are restricted to agriculture and emissions-intensive, trade exposed industries, which initially receive 90% or 60% of allowances free allocated on an emissions intensity basis depending on their level of emissions-intensity. In total, free allocations comprise 21% of the total cap. These allocations may be reduced at 1.3% per year;
- CERs and ERUs can be used without restriction except that forestry-derived long-term CERs (iCERs) and temporary (tCERs) are excluded;
- Domestic forestry can generate and sell NZUs;
- It includes transitional measures, including:
  - A compliance ratio of 1 emissions unit for every 2 tonnes of CO₂ equivalent emitted (the 1:2 ratio)
  - There is a 25 NZD price cap, meaning that emitters can buy unlimited NZUs from the government for 25 NZD/tonne

The transitional measures were designed to “ease in” to the scheme, especially in an international environment where it is not clear whether New Zealand’s trading partners will implement equivalent measures to reduce emissions. When it was designing the Scheme the New Zealand Government was also influenced by the design of the then-proposed Australian Carbon Pollution Reductions Scheme. In particular, the combination of the 1:2 ratio and the 25 NZD price cap generate an emissions “cost” of NZD 12.50 per tonne, which was close to the CPRS’ initial proposed price cap of AUD 10 per tonne. At the time the government expected that this would be modified as the CPRS price cap was lifted.

Table 1: New Zealand Emissions Inventory by Sector, 1990 and 2009

<table>
<thead>
<tr>
<th>Sector</th>
<th>Gg CO₂ equivalent</th>
<th>Change from 1990 (Gg)</th>
<th>Change from 1990 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>23,359.2</td>
<td>31,361.4</td>
<td>+8,002.2</td>
</tr>
<tr>
<td>Industrial processes</td>
<td>3,382.6</td>
<td>4,345.5</td>
<td>-963.0</td>
</tr>
<tr>
<td>Solvents &amp; other products</td>
<td>41.5</td>
<td>27.9</td>
<td>-13.6</td>
</tr>
<tr>
<td>Agriculture</td>
<td>30,277.5</td>
<td>32,810.5</td>
<td>+2,533.0</td>
</tr>
<tr>
<td>Waste</td>
<td>2,051.3</td>
<td>2,018.4</td>
<td>-32.9</td>
</tr>
<tr>
<td>Total (excluding LULUCF)</td>
<td>59,112.1</td>
<td>70,563.8</td>
<td>+11,451.7</td>
</tr>
<tr>
<td>LULUCF</td>
<td>-23,451.1</td>
<td>-26,682.7</td>
<td>-3,231.7</td>
</tr>
<tr>
<td>Net Total</td>
<td>35,661.0</td>
<td>43,881.1</td>
<td>+8,220.0</td>
</tr>
</tbody>
</table>

Source: NZ National UNFCCC Emissions Inventory 1990-2009
Unique Features of the NZ ETS

New Zealand has a number of unique features as an Annex I Party, including:

- A relatively large area of forested or forestable land, which results in a relatively large impact of land use, land use change and forestry (LULUCF). Between 1990 and 2009 removals from LULUCF activities were on average approximately 40% of New Zealand’s total net emissions. The majority of these removals came from new forest establishment (in particular commercial forestry); and

- A very large proportion of animal-based agricultural emissions – nearly half, which is substantially higher than other Annex I Parties. This has also been a substantial source of emissions growth since 1990, mainly caused by rapid expansion in the dairy industry.

In addition, New Zealand’s public sector accounting provides for monthly valuation of their Kyoto Protocol position as a contingent asset/liability on the Crown’s Balance Sheet. The balance sheet impact of this treatment is shown below.

These differences have influenced both the ETS design and its performance. In particular:

- The inclusion of forestry is unique. Forestry was included in the scheme early in an attempt to reverse a sharp decline in removals from LULUCF (and therefore sharp growth in emissions and the balance sheet liability) between 2004 and 2007. It did, indeed, reverse;

- Agriculture is scheduled to be included in the ETS from 2015. This is, so far, unique globally. It is also highly contentious in New Zealand, with a large and powerful farming lobby arguing that output cuts will be needed to cut emissions while the Government argues that agricultural emissions intensity has already been reduced through the application of new technologies and that there is scope for that to continue; and

- Utilisation of accounting valuations of Kyoto surplus/deficit appear to have proven effective in motivating a degree of rational debate and action on emissions reduction. Of the three main sources of emissions or removals, two – namely stationary energy and forestry – are already included in the ETS.

Results to Date: Outcomes

Based on the available data the ETS appears to be having a positive impact on emissions and planned clean investment. Since the introduction of the ETS, New Zealand’s net emissions have declined substantially (Figure 2). Much of this appears to have originated in the forestry sector, which is un-
surprising given that the SEIP sectors have been covered for a short time. Deforestation has slowed sharply and afforestation increased since the start of the Scheme, although it is generally believed that the net deforestation in 2006-7 occurred because (a) foresters were harvesting in anticipation of a potential liability from doing so once the Scheme was introduced and (b) high pastoral land prices between 2004 and 2008. This is supported by the sharp drop in removals between 2007 and 2008 in Figure 3, which shows the latest available data in CO2 equivalent terms. The trend is supported by the more recent data available on changes in planted forest area (Figure 4).

Hydro power accounts for approximately 70% of New Zealand’s power generation. However, hydro capacity is typically old with very limited storage and is located in the South, a long distance from the majority of load in the North. This has caused a number of power shortages, typically when there is a “dry winter”. Prior to the inclusion of stationary energy in the ETS, additions to generation capacity were typically gas or oil based and much closer to load. But little new capacity had been permitted nor added for a decade or more.
One comment compliant of utilities when considering new investment before last year was uncertainty over carbon pricing and since the introduction of the ETS there has been a sharp increase in applications for, and grants of, new permits (consents) for power generation and all of this is renewable (Figure 5).
Much of this generation has yet to be built, and there are other reasons why permitting has increased so rapidly (including substantial changes to the Resource Management Act in 2005, 2007 and 2009). However, the sharp upturn in investment appetite and the dominance of renewable energy suggest an optimistic outlook.

Even though initial indications suggest success in terms of outcomes, current indications are that there has been limited macroeconomic impact. Real GDP has recovered from a dip during the 2008 crisis and is growing reasonably well, inflationary expectations are around 2.9%, and many commentators claim that consumers have felt little if any effect. However, drawing any conclusion to this effect is difficult because most covered entities have only been in the Scheme for a short time and there have, to date, been generous transitional measures.

Results to Date: Domestic and International Markets
Because the NZ ETS has both a domestic unit (the NZU) and access to international units (CERs and ERUs), compliance entities have a range of possibilities open to them to comply with their caps. So far in the ETS prices have largely been driven by domestic demand and supply, in particular by forestry-generated NZUs, which are responsible for approximately 64% of all compliance units surrendered to date, with CERs accounting for only 1.6%.

The low proportion of CERs used does not, however, mean that compliance entities are not interested in using them. Larger emitters have shown sustained interest in CERs, but NZU prices have been lower for the majority of the time. When CER prices have dipped below NZU prices, such as July-August 2011, New Zealand buyers have made substantial purchases of CERs. Compliance entities also tend to value CERs slightly higher than NZUs because of their greater 

![Figure 6: Units Surrendered for Compliance in First Period](image)

![Figure 7: NZU and CER Prices](image)

Source: Bloomberg. NZU price data not publicly available for 19 March – 1 June 2011. December 2011 CER futures closing prices are provided in addition to spot due to spot market illiquidity during the period.
liquidity, although CER prices are driven more by the European market than New Zealand.

Evolution of the NZU and CER price (both in New Zealand dollars) is outlined below. NZUs have generally been cheaper than CERs, resulting in high usage of NZUs for compliance.

That said, the majority of CER purchases by compliance entities have tended to be spot purchases. At the moment few entities seem to be interested in more sophisticated trading strategies using, for example, futures and options. There is, therefore, still considerable opportunity to reduce risk and compliance costs as the market develops.

The NZ ETS Review
This year, New Zealand's government conducted a review of the ETS to review results and look at future changes in light of other countries’ climate change efforts. Although the outcome of the review was politically spun as a “slowing down”, the review concluded that the ETS remains the most efficient method of reducing New Zealand's emissions regardless of the likely absence of an international agreement post-2012.

Key recommendations of the review included a gradual increase in the 25 NZD price cap to 50 NZD by 2017 and phased increasing of the 1:2 compliance ratio to 1:1 by 2015 (which is slower than originally planned). Although these are slower than originally envisaged in the legislation, the overall review findings were positive and point to ongoing use of an Emissions Trading Scheme as the primary policy instrument to address climate change in New Zealand. The Government has not yet adopted nor implemented the review’s recommendations but has shown a favourable reaction to them.

Conclusions
There continues to be extensive debate about the usefulness of emissions trading schemes as a policy tool for reducing emissions. In some countries and provinces there is a policy intention to implement them, while others are questioning their impact.

Although it is early to say definitively, New Zealand, with its unique economic composition among Annex I Parties, appears to be experiencing mainly positive outcomes from the implementation of their emissions trading scheme. Even at this stage it appears that there are some lessons that can be drawn from the New Zealand experience, including:

- Tailoring of the Scheme design to suit local requirements – in New Zealand’s case the explicit inclusion of forestry – has had positive impact;
- New Zealand started with “no” free initial allocation and then made transitional concessions, as opposed to Europe which started with free allocation and is now moving towards auctioning. This seems to have worked well and New Zealand has constrained free allocation to (a relatively small) 21% of total compliance obligation;
- Explicit valuation of their Kyoto position on the Government balance sheet has provided important information into the debate and may have led to a more rational policy design; and
- Utilisation of emissions trading as a primary policy tool can and does work in single countries (whereas the EU is a trading bloc) that have a high degree of exposure to international trade.

Ultimately, though, more time is needed to see whether there is the political will to reduce transitional measures and bring about even more substantial economic transformation. But, as is inevitably the case with their rugby team, the Kiwis are off to a great start.

Geoff Sinclair
is Head of Carbon Sales and Trading at Standard Bank, which is Africa’s largest bank and a major participant in carbon markets and climate finance. He previously worked for the New Zealand Treasury and a wholesale power market operator.
Development of Korean Emissions Trading Scheme
Director-General Chun Kyoo Park, Commissioned Expert Hyoung Kun (Leo) Park, Presidential Committee on Green Growth

Introduction
Since August 2008, Korea has been establishing policies aimed toward green growth including measures for a GHG Emissions Trading Scheme (ETS). The proposed introduction of the ETS is part of the government’s efforts to support a low-carbon society and stimulate green growth. To prioritize climate change in national policy, the Korean government enacted a “Framework Act on Low Carbon, Green Growth” which provides the legal grounds for various green growth measures including Korea’s ETS. Korea has also pledged reduce GHG emissions 30% below Business-As-Usual levels by 2020.

A cap-and-trade ETS was drafted and proposed by the Presidential Committee on Green Growth (PCGG), and the Prime Minister’s Office officially announced its legislation notice on 17 Nov 2010. A public hearing and feedback session took place on the 26 November and was attended by over 300 participants from academia, companies, and NGOs. Following ministerial review, the legislation was finished and the draft bill was approved in a Cabinet meeting on 12 April 2011. The draft bill is now in the hands of the National Assembly where lawmakers have formed a special committee on climate change and green growth to review the bill. The bill is expected to be up for consideration between October and November of this year.

Contents of the Draft Bill of “Act on Emissions Trading Scheme” of Korea

a. Operational Scheme of the Korean ETS
To establish medium to long-term policy direction, the Korean government will draft a basic plan on the Korean ETS every ten years for deliberation and adoption in cabinet. The plan will include preparation and projection of the ETS, fundamental operational direction, analysis on economic impacts caused by the introduction and operation of the ETS, and measures to support domestic industries. The National allocation plan, one of the core parts of the bill, will be drafted by the ‘Allocation Committee’, headed by the Minister of Strategy and Finance. The plan will go through the consultation with relevant ministries, and be deliberated and established by the PCGG and cabinet meeting six months before the beginning of each phase. The plan will include total amount of allowances reserved for new entrants for each trading period and year, coverage standards, methods of allocation, policies to recognize early actions, banking & borrowing mechanisms, and the use of offsets. For the 1st phase, over 95% of allowances will be freely allocated to ease the burdens on the industries.

Concerning the designation of covered facilities facilities, including voluntary participants among those under control of “Target Management System (TMS) explained in a separate box below, emitting GHG of the amount over the level stipulated by the enforcement pursuant to the Framework Act will be designated as covered facilities and the list of them will be notified five months before the beginning of each phase. Currently, facilities emitting over 25,000 tons of CO2e will be covered. An entire cycle of allowances – from application to surrendering – follows this process. First, covered facilities should fill out application forms for allocations and submit them four months before each phase of the allocation plan. In some cases, Ex-post adjustment of allowances may be possible if the overall cap is increased due to a change in allocation plan or covered facilities experience unexpected and unavoidable construction, expansion or changes in business that change their allowance needs. Of course, such needs must be backed up by documents that take external events, such as worldwide economic conditions, into account. To prevent windfall profits and oversupply of credits, the government can retrieve all or some of allocated allowances if the cap is decreased and/or facilities are closed temporarily or permanently. Second, covered facilities should make annual emission inventories that should be verified by independent verifiers before reporting them to the government. The government then certifies the reports submitted by the facilities and lists them on the registry for emission allowances. Finally, the covered facilities shall surrender the emission allowances for the emissions quantity certified by the government. Subsequently, the government will list the surrendered emissions allowances on the registry. In addition, excess allowances that are not banked for the next trading year will automatically be extinguished six months after the end of each trading year.

Operational Scheme of the Korean ETS

| Basic planning | Allocation planning | Designation of covered facilities | Application for allowances | Allocation | Reporting, verification, and certification | Surrendering |
b. Operational Foundation Of The ETS

In terms of the scope of participation in the ETS, covered facilities and individuals or companies which have holding accounts in an allowances registry are eligible to participate in the ETS. However, the Korean government will take a gradual approach to opening its carbon market to individuals and companies that intend to join the ETS for trading purposes. In addition, the eligibility requirements for participation of domestic and international individuals or companies will be articulated by the presidential decree. A registry will be set up and managed by the government to record allowances for each trading phase and trading year and holding accounts for covered facilities, individuals or companies. The registry will also hold new entrant reserve, which is a set aside of allowances reserved for new installations and extensions to existing permitted installation and track transferring, surrendering, banking & borrowing of emissions allowances. Also, an offset registry will be made and incorporated into the allowances registry to manage offset credits.

In order to ensure a smooth transition into the ETS, measures are being taken to stabilize the emissions trading market. Two measures to be included are allowing early auctioning of allowances to prevent a sudden surge of price and auctioning up to 25% of reserve allowances. The level of penalties for non-compliance is a controversial issue. A fine for negligence, not exceeding 10 million won (around 9,300 USD), will be imposed if facilities of allowances fail to surrender emission allowances, falsely report the emission amounts, or fail to reflect amendments in accordance with the result of verification. A penalty surcharge will be imposed (not exceeding an amount calculated by multiplying the average market price of allowances 3 times in proportion to the excess amount of emission, will be imposed). Originally, the government intended to impose a surcharge amount calculated by multiplying the average market price of allowances by 5 but, as a result of discussions with industries, the government decided to ease this level.

Flexibility is the main purpose of introducing an ETS and it plays a critical role in the operation of the ETS. The Korean government intends to permit all of the available flexibility mechanisms such as banking, borrowing, and offset for the domestic ETS. First, after surrendering emission allowances, if facilities still have excess allowances, the excess allowances may be allowed to be banked for the next trading year and phase. However, the allowances cannot be banked between 1st and 2nd phase as the 1st phase is likely to be operated as a trial phase. Also, if a facility cannot surrender allowances of equal quantity of its emissions, it can request for the government approval to borrow allowances allocated to the next or future years within the same phase. However, the allowances cannot be borrowed between phases, a restriction necessary for non-compliance is a controversial issue. A fine for negligence, not exceeding 10 million won (around 9,300 USD), will be imposed if facilities of allowances fail to surrender emission allowances, falsely report the emission amounts, or fail to reflect amendments in accordance with the result of verification. A penalty surcharge will be imposed (not exceeding an amount calculated by multiplying the average market price of allowances 3 times in proportion to the excess amount of emission, will be imposed). Originally, the government intended to impose a surcharge amount calculated by multiplying the average market price of allowances by 5 but, as a result of discussions with industries, the government decided to ease this level.

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to prevent market collapse or distortion. As for offsets, covered facilities can request the government to convert some or all of the emissions reduction achieved through internationally accepted emissions reduction activities into emissions allowances. The converted emissions reduction will be recorded in the offset registry and can be used by the covered facilities when surrendering the allowances. Limitation on the use of offsets and the term of validity of offsets will be determined by the presidential decree.

Other important provisions include the start date of the ETS, linkage with international carbon markets, and financial and tax incentives. The 1st phase will start from 1. January, 2015 but its duration will be determined by the presidential decree. As for linkage, Korea’s ETS can be linked with international carbon markets based on UNFCCC and bilateral agreements with countries in which emissions reductions are properly monitored, reported and verified according to internationally-acceptable standards or deemed equivalent. Also, financial and tax incentives can be provided to prevent the weakening of industrial competitiveness resulting from the ETS. Presuming that the bill goes through the parliamentary approval this year, the act will be enforced next year as the bill states that the act must be enforced within six months after promulgation.

**Issues That Need To Be Further Addressed**

As the draft bill goes through the parliamentary approval process this year, more debates and discussions are expected to arise. Some of the key issues that require further attention are as follows:

An efficient and fair allocation of allowances to sectors, and ultimately to facilities or installations, is the key to maintaining integrity with the national GHG reduction goal. Additionally, efficient and fair allocations will prohibit conflicts amongst stakeholders. A first step towards an efficient and fair allocation is to create a technology data base that contains information on GHG reduction potentials. As long as the government has sufficient information on GHG reduction potentials for various technologies, capabilities of designated entities, and expected development period of the technologies, it can achieve not only an economically efficient free allocation of allowances but also the uphold equity amongst entities. However, ‘information asymmetry’ between the government and industry is inevitable. Here, information asymmetry implies the lack of the government’s ability to grasp necessary information on production planning and technology development from the industry. Therefore, the government is likely to encounter difficulties in achieving a comprehensive and accurate technological database. Additionally, industries may benefit by submitting lower than actual reduction potentials—further jeopardizing the accuracy of a technological database. Schemes for dealing with such information asymmetry can be divided into two major sections. First, constant upgrading and updating of the technological database is a simple and effective way to solve the information asymmetry. Under the “Framework Act on Low Carbon, Green Growth”, designated entities must submit detailed GHG emissions profiles to the government annually. By analyzing the statement and accumulating related information, the government should continuously update and upgrade its technological database and share the database among different ministries to prevent information asymmetry. Second, a more stringent and controversial measure is to work out a regulatory tool which mandates that the technologies be reported to the government. In other words, the government can demand that industries not only submit their GHG emission profiles but also their production capacity, the energy efficiency of their equipment and plans to develop technologies or install new equipment. Also, the government should encourage industry to disclose the Best Available Technology (BAT) within each key sector. However, while implementing such measures, the government must protect the information provided by the industry and reward those who comply well with the government requests. The Korean Government, while focusing on the upgrading and updating of the technological database, will have to encourage the industries to voluntarily share necessary information.

The draft bill allows modifications to the allocation plan including an ex-post adjustment of allowances under unavoidable circumstances due to technological or economic circumstances. However, such modification might cause further disputes as it can affect the overall amount of allocation. Granted, an increase in the production output due to improving economic conditions should be recognized and thus can be subject to further allocation of allowances. Also, it is extremely difficult to allocate the “right quantity” of allowances before a trading phase begins because economic conditions for each phase are highly unpredictable; this has been illustrated in the EU ETS. The ex-post adjustment can not only lead to increases in the cap of national GHG emissions but also violations of the principle of equal treatment among different sectors. To minimize the negative impact of the modification and, ultimately, to achieve the reduction target, the government should clarify the qualifications for the ex-post adjustment when enacting the presidential decree on ETS. In addition, the government should demand that designated entities submit documents explaining unavoidable needs for expansion in production as well as current reduction technologies when they apply for the adjustment. The government should use this information to seek a balance amongst various industries. Also, when an entity asks for an increase in allowances, the govern-
ment should identify whether there are alternatives to GHG reduction such as plans for additional offset activities.

Conclusion
Introduction of an ETS is still a very challenging task in Korea and thus subject to intense debates and discussions throughout the legislation process at the National Assembly. The ETS is a complex system and involves various stakeholders, many of whom are still raising questions on the benefits of the scheme. However, one must not forget the primary purpose of an ETS – that is, to respond to climate change and reduce GHG emissions. Because mandatory cap and trade systems—developed with a high level of environmental integrity and robustly designed—are considered the most cost-effective instruments to reduce greenhouse gas emissions, unproductive disputes should be minimized and more attention should be focused on how to design the scheme correctly. The Korean government has no time to waste on arguing; action must be taken.

Clearly, Korea is relatively in a favorable condition for successful operation of the ETS since it can learn from the EU ETS and thus avoid the mistakes the EU has made along the way. Also, as Korea has introduced the TMS as a precursor to the ETS, the country will certainly be better positioned than others in terms of improving the quality of data, providing experiences for potential participants, and establishing infrastructure necessary for an ETS. Placing a price on carbon through the ETS is essential to encourage the development of the new green economy. A price on carbon sends a strong message across the economy, allowing companies to create value by reducing emissions. A long term price signal is one of the elements needed to boost innovation in clean technologies. It is also essential to guide investors to prevent the long-term locking-in of plants that pollute carbon. In these regards, development of Korea’s ETS could provide an early mover advantage for Korea.

An ETS is not the silver bullet for GHG reduction. In that respect, the Korean government has initiated other important measures such as Renewable Portfolio Standard (RPS) to foster the use of renewable energy and will also consider other policy options. However, the ETS will lay the cornerstone and undoubtedly lead the country to achieve its long-term goal, green growth.

Presidential Committee on Green Growth (PCGG)
On August 15, 2008, President Lee Myung-bak declared "Low-carbon Green Growth" as the country’s new national development vision. In order to ensure effective implementation of this new vision, the President launched PCGG in February 2009. PCGG coordinates and evaluates the green growth policies of various Ministries, as well as undertakes consultation with the diverse circles in the private sector. It is co-chaired by the Prime Minister and an appointed private sector Chairman. The Committee consists of 50 members, 14 of them Ministers and 36 appointed members representing the private sector.
Taiwan’s Climate Policy: Perspectives and Prospects
Hui-Chen Chien, Environmental Protection Administration, R.O.C.(Taiwan)
Wen-Cheng Hu, Fei-Chiao Yang, Chen-Chiu Tsai, Industrial Technology Research Institute, R.O.C.(Taiwan)

1. Introduction
The Republic of China (R.O.C., hereinafter referred to as Taiwan), with its rich ecosystem of high biological diversity, is extremely vulnerable to climate change. In addition to its domestic actions on “energy conservation & carbon reduction” and green industry development, Taiwan currently implements international cooperation activities to establish a bilateral dialogue platform, inviting experts to share technologies and experience on climate change. Taiwan is expanding the efforts to gain global community support for its meaningful participation in the international community. Meanwhile, Taiwan agrees to set firmer targets towards a low-emissions future to assesses how best to meet those targets and to support enhanced actions on climate change in the developing world.

2. Taiwan’s Energy Consumption and GHG Emissions
Taiwan’s total energy consumption has grown drastically over the past two decades, with an average annual growth of 4.4%. In 2010, the energy consumption was 120.3 million kiloliters. Taiwan has an export-oriented economy that is highly dependent on imported energy, and it is difficult to reduce GHG emissions.

Taiwan’s GHG emissions in 2008 were 284.5 MTCO2eq (LUCF absorption excluded), CO2 emissions increased by 115.4% from 1990 to 2008 and 92.7% for energy related CO2 emissions. Based on the fossil fuel combustion, the energy industry sector accounted for only 10.5% of total CO2 emissions, the industrial sector 47.5%, the transportation sector 13.4%, the commercial/residential sector 27.4%, and the agriculture sector 1.2%. The commerce and residential sectors showed higher growth in the past 20 years, similar to most developed economies. The CO2 emissions from fossil fuel combustion in 2008 decreased by 4.1%. Three main reasons for negative growth for 2007-2008 are economic recession due to the global financial crisis, a decrease in energy consumption after rationalization of oil prices and electricity prices, and finally the fact that government is vigorously pursuing policies/measures on energy saving and carbon reduction.

3. Responding to Global Carbon Reduction
After the Copenhagen Conference in December, 2009, the Taiwan Government set up the “Executive Yuan Steering Committee on Energy Conservation and Carbon Reduction” in response to the “Copenhagen Accord” to fulfill its obligation as a member of the global village. Additionally, it actively designed the “National Energy Conservation and Carbon Reduction Master Program.” The Copenhagen Accord requests all countries to adopt the appropriate reduction actions for GHG mitigation based on the measurable, reportable and verifiable (MRV) mechanism. Accordingly, the policies and programs implemented on energy conservation and carbon reduction will use a new format in compliance with the Accord, and will lead to the specific Nationally Appropriate Mitigation Actions (NAMAs).

Actions taken will: “promote low-carbon energy development, reduce demand for fossil fuels, and enhance energy security,” “convert crisis into opportunities with low carbon technologies development and green jobs creation,” “respond to global trends in the development of low-carbon economy, design blueprint of low carbon society,” and “announce the willingness in responding to international conventions for avoiding boycotts from the global community” etc.

As part of the effort to transform Taiwan into a low-carbon society, the Taiwan Government has started the development of legal foundation, combining several multi-dimensional strategies on sectoral reduction implementation, adopting market mechanisms, enhancing education and promotion. The government is also developing international cooperation and integration of multi-ministerial capacity and industrial technology for implementation of key benchmark programs to achieve targets in 2010, the year of “Energy Conservation and Carbon Reduction.”

4. Taiwan’s Voluntary Reduction Target and Approach

(1) Voluntary Reduction Target
To fulfill our obligation as a member of the global village and to actively respond to the “Copenhagen Accord,” the Taiwan EPA has convened more than 8 multi-ministerial meetings after the Copenhagen Conference (2009), together with academics and experts, reviewing and discussing energy efficiency improvement and sectoral reduction measures based on the “business as usual” (BAU) scenario simulations of GHG emissions of Taiwan.

1Taiwan’s GHG emissions inventories http://unfccc.epa.gov.tw/unfccc/english/04_our_efforts/05_ggh.html
It is also practically designing feasible policy and supporting measures on effective concrete implementation with subsequent submission of the MRV voluntary Nationally Appropriate Mitigation Actions. The following results have been achieved through these actions:

A. Calculated CO2 emission baselines related to fuel combustion for the three scenarios (high, middle and low economic growth), based on projections for Taiwan's fuel combustion related to BAU CO2 emission scenarios.

B. Set up a voluntary commitment to the target of at least 30% reduction based on business-as-usual (BAU) of the total GHG emission volume by 2020. The scale of reduction is much higher than that of those countries with comparative competitiveness with Taiwan, for example 30% reduction based on BAU in Korea and 16% in Singapore.

C. Compliance with Taiwan's policy of high economic growth and timetable on carbon reduction declared by the President and the Cabinet, target is set to cut carbon emissions to 2005 levels by 2020 and even the GHG reduction of all major Taiwan development projects must be in line with the same target in adopting reduction measures, comparable to 45.8% below the BAU by 2020.

D. To meet its voluntary target, Taiwan adopted a sustainable energy policy as a triple-win solution for Energy, Environment and Economy. The target has been set at minimum 2% energy efficiency enhancement each year in the following eight years with minimum 20% energy intensity decrease by 2015 comparing to 2005 and 50% by 2025, through technological breakthroughs and support measures.

(2) Voluntary Reduction Actions

Taiwan initiated planning of appropriate mitigation actions for major sectors, following the bottom-up approach by complying with the MRV principle and conducting cost-benefit analysis on mitigation potential for these actions in order to develop Taiwan’s country-specific NAMAs. This will uphold the principle of common-but-differentiated responsibility in building Taiwan’s ability to reduce carbon emissions while taking into account environmental, social and economic aspects with regard to the implementation of voluntary reduction actions.

To establish a strong legal foundation of sustainable development promotion, the Taiwan Government accelerated the four carbon reduction legislations towards full complementary functioning. The “Renewable Energy Development Act” passed in 2009 will stimulate the energy supply structure towards the adjustment to free-carbon while the “Energy Management Act” amended in 2009 with a penalty tool will enforce high energy efficient facilities and products in industries. The Draft “GHG Reduction Act” (Taiwan EPA) has currently completed first reading in Legislative Yuan, requiring major carbon emission sources to reduce annual emission volume and also establishing a cap-and-trade system on carbon emissions.
reduction through carbon credit trading. The Draft “Energy Tax Bill” (Ministry of Finance) provides incentives to stimulate consumers in adopting low carbon and high energy efficient facilities and products through economic measures. The four legislations will be under full complementary functions and the last two legislations are in need of early completion.

To implement domestic energy saving carbon reduction measures and strengthen cross-department integration, the Executive Yuan founded “Energy Saving and Carbon Reduction Promotion Commission” in January 2010. In March 2010, the Executive Yuan's Energy Saving and Carbon Reduction Promotion Commission published the national energy saving and carbon reduction plan, covering ten benchmark programs. Each department will strive to achieve its annual target, and then the national greenhouse gas reduction target will be attained through accumulation of contribution from each department. At this stage, a total of 230 action plans have been implemented in 2011 in Taiwan. Based on projected BAU scenario under high GDP growth, the CO2 emissions will be 465 MT in 2020, requiring 213 MT reductions to achieve the reduction target of 252 MT and 45.8% reduction from BAU scenario. With current reduction policies in place, total reduction estimation is 124 MT, leaving the reduction gap of up to 89 MT (Figure 1). Additional measures or adaptation of market mechanisms are necessary to fill the gap; key strategies on implementation of energy conservation and carbon reduction need to be contemplated.

Furthermore, the Third National Energy Conference (2009) concluded that the Taiwan EPA would develop the “Low-carbon City Implementation Program.” In the subsequent two years, each local government will initiate two low-carbon cities or fifty low carbon communities based on village or metropolitan community, with the participation from public sector and private sector, schools, households within their jurisdiction. By 2014, each local government will initiate six low-carbon cities, based on the number of towns or metropolitan areas (Figure 2). The final target is that four low carbon metropolitan areas will be developed in each of the northern, central, southern and eastern parts of Taiwan by 2020.

This has been a challenging task with a high degree of complexity. It is important to change energy consumption structures and raise awareness of low-carbon lifestyles to improve quality of life in harmony with nature. Such efforts will lead to greener lifestyles for local residents and increase employment opportunities, create an environment conducive to organic growth. It will also duplicate such communities and encourage participation of energy service companies (ESCOs) in the building of low-carbon communities.

<table>
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<tr>
<th>Figure 2: Low Carbon Community Promotion Initiative</th>
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<td><strong>Renewable energy conservation</strong></td>
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<td>❯ Renewable energy planning</td>
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<td>❯ Wind power</td>
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<td>❯ natural gas replaced by Solar thermal energy</td>
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<td>❯ Energy conservation</td>
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5. Establishing MRV Mechanisms for GHG Mitigation Efforts

Inventory compilation of GHG emissions from the industrial sector is currently promoted in line with legislative progress of the Draft “GHG Reduction Act.” The early action crediting plan or carbon offset program for Environmental Impact Assessment (EIA) projects is progressing before the Bill becomes effective. After the Bill is passed and takes effect, mandatory inventory reporting, performance standards applied to covered sectors and offset trading will be initiated. Finally, in line with international developments, a cap-and-trade scheme is planned to set up to eventually link with other schemes around the world. Additionally, planning and establishment of an internationally compatible management system for the certification and verification of organizations, plus other relevant supporting measures are being pursued to build up Taiwan’s capacity in conducting third party certification of GHG reduction efforts. As for the industrial sector, a National Greenhouse Gas Registry Platform has been launched.
Meanwhile, Taiwan's EPA published several internal rules and principles for GHG management processes and criteria including, "Management Principles of GHG Verification Bodies (6 November 2009)," "Management Principles of GHG Inventory and Reporting (10 September 2010)," "Promotion Principles of Early Actions and Offset Projects (10 September 2010)," and "Management Rules of GHG Reduction Credits and Accounts (18 April 2011)." These rules are intended to promote voluntary early action and pilot emissions trading before the GHG Reduction Bill is passed. Figure 3 shows the progress up to date in setting up Taiwan emission credits management system. The orange dotted boxes indicate completed systems, including the national registry for inventory and reduction credit registration which was already operating in 2007. The rules for accreditation entity and verification bodies and for early action crediting are also in place. Currently, progress is made in developing mechanisms for the international offset and the domestic trading platform.

To ensure a smooth implementation of the carbon trading scheme, the EPA also plans to deploy the following supporting measures:

1. **MRV Mechanism**: assures that all sectors follow international MRV requirements when reducing their GHG emissions or generating offset credits.

2. **National Registry**: serves as the national GHG emissions database, and provides a transparent management system for emitters.

3. **Offset Project Management System**: manages early action that the government has been promoting over the past years, and issues offset credits following MRV requirements.

4. **Carbon Credit Management and ETS**: establishes a system which is capable of linking with international markets, offers participants a fair and open trading environment.

5. **Foreign Offset Credit Transfer Mechanism**: provides a strict reviewing process to ensure the credibility and cancellation of foreign offset credits, to avoid reselling.

Under current planning, domestic businesses should pursue domestic GHG reduction plans as a priority. Additionally, they may also seek to conduct bilateral or multilateral mitigation projects with countries (with or without diplomatic relationships with Taiwan), based on offering financial or technical assistance to non-Annex I parties. Carbon offsets, generated through these projects, may then be certified through the UN Clean Development Mechanism (CDM) for importation to offset Taiwan’s total GHG emissions. Currently, obtaining Certified Emission Reductions (CERs) through CDM projects most securely accrues credible carbon offsets. To address domestic and international issues with obtaining and transferring credible carbon offsets, the MRV principle should be followed in planning and designing Taiwan’s domestic carbon trading platform and carbon allowance management scheme, which is capable of linking up with future international carbon market. Figure 4 outlines an overview of our domestic reduction credits source and application. Before the cap is set, early action and offset credits can be used to meet EIA, performance standard, and permit requirements. After the cap-and-trade scheme is implemented, such credits can be used to offset emissions over the allocated amount. Regarding international offset, the main standard under consideration is the CDM. CERs and other credits approved by the UNFCCC must be approved by the EPA and then be issued to the domestic account in the central GHG registry so that they can be used for domestic offset.
6. Conclusion

The Bali Action Plan listed the MRV as an essential element in the global climate scheme for the post-Kyoto period. Although the international MRV practices are still under negotiation, these practices will be closely linked to the compiling process and content of future national reports and largely affect the proposals for implementation of NAMAs. Therefore, the capacity building for MRV shall not be delayed until the legally-binding international climate agreement is reached.

In the process of developing the NAMAs for Taiwan, apart from meeting the aforementioned strategic characteristics and constructing comprehensive national or sectoral strategies, the energy efficiency standards, emissions benchmarks and inventory mechanism should also be established in compliance with the Draft “Greenhouse Gas Reduction Act.” The proposed NAMAs should also take into account the principle of maintaining social fairness, justice and care for low-income families, in order to maximize the effects of these GHG reduction actions.

Above all, the NAMAs developed in Taiwan have advanced voluntary targets in all sectors, from energy, industry, agriculture, transportation to commerce and residence. Taiwan continues to make efforts to create a better environment with a low-carbon society for generations to come.

Reference


Wen-Cheng Hu, “The MRV Scheme for GHG Reduction Actions in Taiwan”,


ITRI

Founded in 1973, the Industrial Technology Research Institute (ITRI) is a non-profit R&D organization, with the functions of engaging in applied research and technical services to accelerate industrial development in Taiwan. As a non-governmental organization observer admitted at the first session of the UNFCCC COP, ITRI has been actively participating in the development and implementation of international climate change mitigation technologies and strategies.
Policy and Politics of a Carbon Market in China
Wu Qian, British Embassy Beijing

Introduction
China used to regard carbon markets as not an option, but now regards carbon markets as an urgent task to study in a set timeframe. While struggling to reach targets on energy intensity, interest in carbon pricing is increasing among Chinese think-tanks and officials. Therefore, the cap and trade scheme debates have started recently. Despite significant difficulties, we can expect China to step up piloting of emissions trading in the 12th Five Year Plan period. This paper examines, from a policy perspective, the following areas:

1. China’s transition from command-and-control approaches to market mechanisms,
2. China’s considerations of cap-and-trade,
3. barriers to carbon trading pilots and
4. outlooks for the future.

From Regulatory Approach to Market Mechanism
So far, China’s approach to controlling GHG emissions has been based on a direct regulatory (command and control) system. Energy intensity targets have been set at the national, provincial and large-company level. However, reductions in energy intensity have largely been achieved by enforced closure of inefficient power plants and factories. Economic tools (resource taxes, tax breaks, and channelling of subsidies and investment) have played a limited role.

At the same time, China has been the biggest seller of carbon offsets through the UN’s Clean Development Mechanism (CDM). 46% of all CDM projects and 58% of all CDM emissions offsets are from China, equivalent to about 431 mega tonnes CO2e.1 This figure is significant, but very small compared with the scale of the challenge – China’s total carbon emissions in 2010 were 8.95 gigatonnes.2 While this has spurred the development of renewable energy, for example hydro and wind power, the GHG reductions associated with CDM itself are not enough to achieve China’s ultimate goal of sustainable development.

If China moves beyond CDM post-2012, participating in the type of scaled-up market mechanism such as a domestic trading scheme, she would have a lot to gain economically. However, the lack of political will for pricing carbon emissions has prevented that from happening. In international negotiations, China has said that an absolute cap on emissions (‘cap-and-trade’) is not an option for the foreseeable future. Also, China has resisted agreeing to sectoral crediting or trading schemes.

In the absence of a carbon price, China’s regulatory approach to achieve energy intensity reductions is not working perfectly. Although the original target was 20%, China only managed to lower energy intensity by 19.06% from 2006 to 2010 and even this result involved political intervention such as electricity rationing. Consequently, officials and policymakers recently appeared more willing to consider economic tools to help achieve energy intensity targets. China is currently exploring two options for pricing carbon: taxes and trading.

For a time, a carbon tax was considered more attractive than a carbon market. Therefore, the Energy Research Institute (ERI) and the Research Institute of Fiscal Science proposed a tax on carbon. Although the Ministry of Finance is considering these recommendations, no commitments have been made and debate persists over the appropriate level and scale of taxation. The National Development and Reform Commission (NDRC) is slowly rolling out new “resource taxes”, levied on the exploration of oil and natural gas (but not yet for coal). A carbon tax would be considered after these resource taxes were implemented. If introduced, a carbon tax would start low and gradually rise. Recently, carbon trading became a preferred option because the government is worried that adding a new tax would provoke strong resistance in a high inflation Chinese economy.

China Considers Cap-and-Trade
China’s central government is planning to use carbon trading as one measure to reach its goal of cutting the carbon intensity (carbon emissions per GDP) 40-45% below 2005 levels by 2020. This is different from the energy intensity based on the energy consumptions per GDP. The target was first announced two years ago, right before Copenhagen, and is now written into China’s 12th Economic and Social Planning Five Year Plan; “China will establish an effective system for calculating GHG emissions and gradually create a carbon emissions trading system.” NDRC’s climate change department and its
local affiliations will take the lead, and coordinate with other departments, to implement this plan.

1. Locations Covered
Currently, NDRC has encouraged – but not yet specifically requested – every local government to assess potential designs and impacts of carbon trading schemes. NDRC is to work together with particular regions to develop trading pilots. Specifically, two provinces and four cities were initially identified: Guangdong, Beijing, Shanghai, Tianjin, Chongqing and Hubei. Among the six regions, some want to try cap and trade schemes, and some rather design efficiency driven or project based trading schemes due to concerns of capping emissions directly.

2. Caps to be Decided
There is some increasing support for cap-and-trade in China. Specifically, in August 2011, two senior NDRC climate change officials spoke separately about the importance of cap-
ping emissions and developing pilot carbon trading schemes\(^4\)\(^5\). In addition, an influential government think tank recognised that an absolute cap is fundamental in an article published in Quishi, the Chinese Communist Party flagship magazine, stating that “it is only under an absolute emissions cap that carbon emission permits will become a scarce resource and possess the qualities of a commodity\(^6\).” However, there is no agreement on whether a cap should be absolute or intensity-based. An absolute carbon cap has the advantage of getting reductions fixed up front. The alternative approach, a carbon intensity cap is less controversial as reductions will be agreed in condition to GDP.

In contrast to the European Union Emissions Trading Scheme, it seems a carbon cap in China (either absolute or intensity based) would be allowed to grow early on to accommodate development needs. For example, total emissions would still increase in a trading scheme but increase less compared with a model in the absence of trading. China considers its targets set for the 12th Five Year Plan challenging – a 17% cut of carbon intensity, 16% cut of energy intensity and 11.4% share of non-fossil fuel energy. Any trading schemes designed are meant to help China achieve these targets effectively but not yet go far beyond. In this sense, carbon emissions will still be growing at certain level. As a result, a declining cap is currently considered unfeasible.

There are also proposals to include a nationwide “energy cap” and trade quotas based on energy consumption. There is general support for reducing energy usage. Regions that are not going to develop Emissions Trading Scheme (ETS) pilots can still impose energy caps in some sectors. If applied, energy caps will be used to calculate carbon caps of trading programmes. However, there is no agreement as to whether China will implement national energy or carbon caps.

3. Sectors Involved
The power sector has piloted several important projects. Chinese ETS studies have suggested that energy intensive sectors and large emitters should be included in trading programmes first. Consequently, the power sector is extremely important. According to ERI, two of China’s top-five power companies (Datang and Guodian) have started piloting GHG emissions measurement and reporting in preparation for future trading. In a small group of power plants, trading simulations were expected to roll out but were delayed because there was no incentive to accurately report data and no reward for early participation.

In 2010, China implemented “Inter-grid trading” among regional grid companies to save energy; this programme adjusts the distribution and usage of electricity across regions. Although power companies are taking important first steps towards a carbon market, they require stronger incentives.

Cement, iron and steel are less controversial as the growth rates of those sectors would start to decline in the near future. Heating and operational emissions in urban buildings have drawn lots of attention recently.

Barriers to Cap-and-Trade
NDRC aims to set up a national carbon trading system by 2015. This schedule is thought to be very ambitious because many issues are preventing support including 1) opposition from within the government, 2) China’s energy consumption and prices, 3) expected inflation and its effect on low-income groups, 4) uncertainty regarding carbon intensity targets and 5) industry’s inexperience in measuring and managing emissions.

First, dedicated climate change authorities are now facing challenges and criticism from different parts of the Chinese government. Specifically, economic and industrial authorities argue that capping emissions will hurt companies; finance authorities think that carbon trading will bring new market risk despite the fact that some companies and banks which are already experienced in reporting data or supporting green finance recognise the values of ETS. China recently established climate change authorities. This emphasizes the urgency and importance of pilot trading programmes; NDRC pilots will mobilise more resources and train more professionals to implement low carbon policies. NDRC also plans to set up an inter-department agency. Taken together, these initiatives give Chinese climate change authorities an opportunity to prove the effectiveness of carbon markets.

Second, particularly for China, achieving green growth is not a straightforward task. Over 70% of energy use is based on coal. In recent years, China became the second biggest oil importer in the world after the US. The demand for energy will only increase in the next fifteen to twenty years. Even with investments in a low carbon economy, strong tax incentives and fuel subsidies for fossil fuels still remain to keep these energy prices artificially low.

\(^2\)“China to impose carbon caps” by Li Jiang, China Daily
\(^4\)“China studying regional CO2 caps - official” by David Stanley, Reuters
\(^5\)“Issues to be tackled in setting up Chinese carbon market” by China’s Development and Research Centre of China’s State Council
Asia Pacific Market On The Rise

Wu Qian

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Third, the government is very concerned that allowing energy prices to climb freely will exacerbate inflation and hurt low-income groups. The government has prioritized closing the gap between rich and poor. In this context, the government may look favourably at options that allow carbon price to grow while, at the same time, transfer money generated from trading back to low-income groups.

Fourth, an accurate level of mitigation through trading can't be decided upon. Supposedly, carbon intensity targets for each province have just been concluded by NDRC. However, the figures have not been announced; negotiations over carbon intensity targets at the provincial level are not finished. Moreover, negotiation is expected to happen at the industry level afterward causing further delays.

Fifth, many enterprises lack the capacity to measure and manage their emissions. Significant improvements in monitoring, reporting and verification are required before a successful carbon market is introduced.

Encouraging Signs for Cap-and-Trade Pilots

Growth is still the first priority for China. China still considers climate change as a development issue, not a security issue. Additionally, carbon trading is one out of dozens of issues in the 12th Five Year Plan. Although supporters may want to carry out carbon trading pilots for different reasons, there is a consensus: pilot programmes will be implemented. Despite great difficulties, there are encouraging signs that could lead to additional pilot projects for ETS.

NDRC is taking a gradual approach with a clear time table. With the ultimate goal of creating a centralised cap and trade system, NDRC allows testing of different trading schemes in the piloting period. The timeline is to pilot carbon trading at a regional level by 2013 and at a national level by 2015. In the pilot phase, local governments can decide upon the means of capping and select capped sectors by themselves. They can also just work from a baselines setting or offsets scheme. Lessons from all of these practices should benefit a cap and trade scheme. In China, the future of carbon trading depends on the aforementioned pilot programs.

China has taken the first step to set emissions related targets. The State Council, China’s cabinet, recently announced the energy intensity targets from 2011 to 2015 for each province together with caps and allocation of major pollutant emissions. (See table) The plan shows that China will reduce energy intensity by 16%, sulphur dioxide emissions and Chemical Oxygen Demand by 8%, and nitrogen oxides by about 10% from this year to 2015. Carbon intensity targets will come out next.

NDRC has set priorities to improve GHG emissions data at provincial level by training professionals in verification and registry creation. Some aforementioned provinces and cities are on track to work out their plans to build trading schemes by 2013. Specifically, Guangdong province aims to design China’s first regional carbon market with trading in key sectors. The Development and Reform Commission of Guangdong Provincial Government has delegated some local research institutions to propose an implementation plan. In the next two years, they will be looking at every aspect of the ETS in local terms including modelling to set emissions target, analysing impacts on sectors and deciding on allocation methods. Legal frameworks and MRV principles will also be examined. Guangdong may consider inter-provincial trading which could eventually pave the road to a national Chinese carbon market.
Carbon Trading in the Chinese Building Sector
Sandra Greiner, Karla Lieberg, Climate Focus

Introduction
While carbon trading in China seemed to be a distant prospect just a few months ago, it has already become a reality in the country’s low carbon strategy making. In the near future, pilot schemes will be introduced, providing “lessons learnt” for the establishment of a nationwide scheme. China has been the largest provider of CDM credits over the past years and the Chinese government has been actively promoting the mechanism and established a strong national regulatory framework. However, with the lack of an international framework agreement and an ambitious national target to reduce the carbon intensity of the economy, the focus of the Chinese government and many stakeholders is shifting to national GHG markets. Particular attention is currently paid to the development of domestic carbon trading schemes.

The Chinese Ministry of Housing and Urban-Rural Development (MOHURD) is among the front-runners of these initiatives and has developed different options for carbon trading for the building sector. The options are about to be tested in a handful of pilot cities. While MOHURD’s primary intent is to put a lid on the huge amount of energy that is wasted by Chinese buildings, the application of a carbon trade scheme has to be aligned with China’s overall climate change strategies. At the moment, MOHURD is among the first to present detailed options for a carbon trading scheme.

In the long term, the trading scheme for the building sector should be integrated into the planned national scheme. For this, detailed regulations to ensure the interchangeability of carbon credits from the different sectors, uniformity of standards and consistency in monitoring and verification are needed. A similar framework would be required to link the scheme to carbon markets in other countries. For the time being, however, the focus is on the national market.

Developing domestic carbon market structures in China
In its submission at COP15 in December 2009, China officially announced the objective to reduce the carbon intensity of the economy per unit of GDP by 40–45% by 2020 against 2005 levels. According to an estimate, this would require emission reductions of 8 billion tons CO2e over the next 10 years—compared to total EU-27 emissions of 4.2 billion tons CO2e in 2005.1 The 12th Five Year Plan running from 2011 to 2015 outlines first concrete steps and strategies to achieve the overall objective. Specific targets for that period are a 16 percent reduction in energy intensity and a 17 percent reduction of CO2 emissions per unit GDP by 2015.

In order to achieve these targets, China is developing a comprehensive set of national policies to enhance low carbon development. The official announcement to rely on carbon finance marked a notable change in the government’s stance, as the Chinese government adopted a restrictive attitude with regards to the national application of carbon finance in the past. The announcement took concrete forms when the National Development and Reform Commission (NDRC) mandated five provinces and eight cities to explore the use of new and innovative instruments to adopt a low carbon development pattern. These so called low carbon pilot regions have the task to develop local low carbon development plans and define policies and strategies to achieve them. The pilot cities are explicitly instructed to investigate new, innovative incentive mechanisms. The pilot implementations however are only a step away from the establishment of a national carbon trading scheme, which the NDRC announced for 2015.

Tackling the Building Sector
The Chinese building sector consumes more than 650 million tons of coal equivalent (1.9 million TJ) annually—more than Germany’s total primary energy consumption.2 Of the existing buildings, 80% are classified as “non-energy efficient”, meaning poor energy performance with excessive energy demand for heating and cooling. The lack of proper insulation becomes especially obvious during the cold winter months when indoor room temperatures do not even reach the national minimum standard of 16°C in many buildings. Besides energy inefficient buildings, heat losses during transmission and inefficient heat generation facilities contribute to the high energy consumption levels.

China’s urban population is already twice the total population of the United States—and is further growing.3 While the country is undergoing rapid urbanisation, 2 billion square met-

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1 Luetken 2010
2 In 2008, energy consumption in buildings amounted to 655 million tons of coal equivalent, making up 23% of the total energy consumption. (Tsinghua 2011)
3 Germany’s primary energy consumption was 335.28 Mtoe or 480 million tce in 2008. (IEA 2010)
4 In 2009, 622 million people lived in Chinese cities (MOHURD 2011)—twice the amount of the current US population of 312 million (US Census Bureau 2011).
Asia Pacific Market On The Rise

ters of new buildings are built in China each year. The growth in energy consumption is expected to continue, even though requirements on energy performance of new buildings have been introduced as early as 1986 and are constantly tightened.

The per capita energy consumption in China is increasing sharply as a result of rising living standards and the increasing requirements of the Chinese population on living comfort, even while the per capita energy consumption in buildings and per capita living space is still far below that of the US. In addition, the higher economic status and growing purchasing power also affects the demand for shopping malls, hotels, restaurants and amusement facilities, dramatically increasing energy consumption in the commercial building sector.

Due to its high energy consumption profile, the building sector ranks high on the national priority list for tackling energy efficiency.

How Does Trading Help?

Previous instruments addressing energy efficiency in buildings range from mandatory efficiency standards and subsidy schemes to energy consumption monitoring. These instruments however have failed to incentivise comprehensive approaches to energy savings and emission reductions. Energy efficiency standards – the main tool to stimulate energy efficiency – are limited to the building design, without any requirements on efficiency levels during building operation. Retrofit quotas and a supporting subsidy scheme led to the retrofit of several million square meters – but did not incentivise retrofits in buildings where most energy savings can be achieved per invested amount of money.

To effectively incentivise emission reductions, a scheme has to target actual emission levels, while allowing for flexibility in reducing emissions. This is where a trading scheme can provide a viable alternative or complement the existing policy framework. A carbon trading scheme can deliver the following advantages:

- **Efficiency:** A trade based approach enables emission reductions at lowest cost and allocates resources to those abatement activities that are most cost-efficient.

- **Selective limitation of emissions:** Under a carbon trading scheme, emissions of certain participants can be capped, limiting emissions from that segment, while allowing overall emissions to grow as the sector further develops.

- **Responsibilities:** The proposed trading options clearly define the obliged participants, thus overcoming split incentive structures of the building sector.

- **Monitoring of emission levels:** Monitoring of emission levels allows counting emission reductions from the building sector against a larger emission reduction target and estimating the impact of investments or of subsidy schemes.

- **Continuous incentive to improve:** As each ton of reduced carbon can be monetised on the market, participants of a trading scheme are incentivised to continuously reduce carbon emissions.

Recently issued regulations can provide the basis for a trading scheme, such as a circular that stipulates the research on energy use caps for energy saving certificates and the trade thereof.

**MOHURD’s Initiatives**

With the support of Climate Focus, MOHURD has developed initial designs of three trading schemes targeting non-residential buildings, the residential building sector and heat supply facilities. The trading schemes are currently translated into implementation plans that detail the regulatory, institutional and technical framework required for the establishment of a carbon trading scheme. These implementation plans form the basis for the selection of the pilot regions and eventually the trial implementation of the schemes. After many rounds of expert workshops and consultations with external stakeholders MOHURD has decided to pursue the below options.

**Cap-And-Trade for Non-Residential Buildings**

The first trading scheme caps the emissions of large non-residential buildings, thus creating incentives for emission reduction measures.

- **Participants:** Owners of buildings with a floor area exceeding 20,000 m² are the obliged participants.

- **Target:** Each participant under the scheme receives an allocation of allowances reflecting the emissions he is entitled to emit over the compliance period. The amount

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5 Between 1996 and 2008, electricity consumption in residential buildings increased by 600%. (Tsinghua 2011)

6 Between 1996 and 2008, the area of non-residential buildings grew by 150% to 7.1 billion m². The current non-residential building stock is equivalent to over 740,000

7 NDRC has recently announced the introduction of a graduated electricity tariff for households. (NDRC 2010)

8 MOHURD and Ministry of Finance 2011
of allowances is determined on the basis of historic emission levels factoring in a reduction by a pre-defined percentage. In case of new buildings, emission benchmarks are established using modelled energy consumption based on building design and the mandatory building code applicable to the respective region.

- **Organisation:** In order to maintain emissions within stipulated levels, owners of targeted buildings are in charge of implementing measures to reduce carbon emissions, including energy management, energy retrofits and the application of renewable energy technologies. By the end of each compliance period, an independent third party verifies the amount of emissions the building has generated, based on which the building owner is required to submit a corresponding number of allowances. In case the emissions of a building exceed the allowed levels, its owner is required to purchase additional allowances – or faces a penalty. Excess allowances can be sold.

**Subsidising Retrofits in Existing Residential Buildings in Heating Regions**

This scheme introduces actual carbon emission reductions as the basis of disbursement of subsidy funds, thus creates incentives to invest money where most energy savings and emission reductions can be achieved.

- **Participants:** The scheme obliges provinces in Northern Chinese heating regions that in turn pass the obligation to the cities within their administrative district.

- **Target:** Under the scheme, provinces receive an emission reduction target for the residential building sector expressed in t CO2e.

- **Organisation:** Cities implement retrofits and monitor post-retrofit emission levels that are compared against a pre-defined baseline. Emission reductions are verified by a third party before being recognised as Emission Reduction Certificates. Emission Reduction Certificates generated on a city-level are purchased by the provincial government in a form of subsidy allocation. Cities that fail to comply with their emission reduction obligation have to purchase Emission Reduction Certificates from the provincial government to offset their excess emissions.

**Controlled Growth of Emissions From Heat Supply Facilities**

The proposed trading scheme caps the emissions from existing large-scale heat supply installations while allowing the sector – and potentially emission levels – to grow to supply heat to new settlements.

- **Participants:** The scheme targets all heat supply facilities of a certain scope.

- **Target:** Existing facilities receive free emission rights that reflect their historic emissions. At the same time, they face the obligation to reduce emissions by a predefined percentage. Emissions of new heat supply capacities have to be offset with emission reduction credits or additional emission rights have to be purchased.

- **Organisation:** The participants are obliged to reduce carbon emissions through retrofit of the heat generation facilities, improvements of heat transmission grids and increases of energy efficiency in the buildings connected to the heat supply system. For any emission reduction beyond the stipulated target, tradable energy reduction credits can be claimed that have to be verified by an independent third party. At the end of a defined compliance period, all participants have to hold emission rights equivalent to their emissions and meet the required emission reduction targets.

**Outlook**

MOHURD’s initiative to use carbon trade for controlling the emissions from buildings is exciting; first because it constitutes a real first step towards domestic emission trading in a non-Annex I country, not least the largest CO2 emitting country in the world. While a handful of developing countries have announced plans to develop domestic trading schemes, the first schemes have yet to be put into operation. Given China’s often breathtaking speed of development, it may well be the first to enact a trading scheme for some of its sectors, provided that pilot applications deliver positive results, all options are scrutinized and carbon trade will stand the test of being in the national interest. Secondly MOHURD’s initiative is exciting as it concerns the building sector, a sector that like transport has not seen the fruits of carbon trading so far and has been on the sidelines of the CDM. If China manages to use the carbon trade instrument in a meaningful and effective way for the building sector, a sector that is among the most difficult when it comes to controlling emissions, a very important precedent will be set.

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*The Chinese government has classified China into five different climate zones: “extremely cold”, “cold”, “hot summer and cold winter”, “hot summer and warm winter” and “warm”. The heating and cooling systems vary according to the different climate zones and only design codes for Northern “cold zones” and “extremely cold zones” stipulate heating systems.*
Karla Lieberg, Sandra Greiner

Karla Lieberg is chief representative in Beijing and Sandra Greiner is a senior project manager at the carbon market advisory company Climate Focus. Under the framework of the partnership between the Federal German Ministry of the Environment (BMU) and MOHURD, Climate Focus supports MOHURD in the development of design options for a domestic trading scheme in the Chinese building sector and the development of a Programme of Activities for new buildings in Southern China. The pilot implementation of a domestic trading scheme is currently under discussion.

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1. Introduction
Over the past decade, Japan has an emerging carbon market, which was non-existent before the Kyoto protocol. While there have been discussions regarding cap-and-trade at the national level, compulsory policies remain extremely controversial with particularly strong opposition from the industrial sector. Currently, Japan has decided neither to immediately introduce a compulsory cap-and-trade system at the national level nor to join the second commitment period of the Kyoto Protocol. Therefore, the future of carbon markets in Japan is uncertain.

This paper outlines the evolution of the Japanese carbon market over the past decade and provides an outlook of the possible carbon market in Japan after 2012. Our analysis divides the Japanese carbon market into the following four areas: 1. international credit under the Kyoto Protocol, 2. domestic carbon trading at the national level, 3. voluntary carbon offsets and 4. local government initiatives for carbon trading. In the following sections, these four areas are examined individually.

2. International Credit
Since Japan is a party of the Kyoto Protocol, there is a market for Kyoto units to be used for compliance. The Japanese Government has already contracted to acquire almost 100 million t-CO2 of certified emissions reductions (CERs) and AAUs from the international carbon market over the first commitment period of the protocol. The amount of 100 million t-CO2 was set at the governmental plan for the Kyoto target in 2005, revised in 2008 (Government of Japan, 2008).

In addition to the government, Keidanren (Japan Business Federation), the largest GHG emitter in Japan, introduced the “Keidanren voluntary action plan” to reduce their emissions. In the plan, Keidanren members may purchase Kyoto units at their own expense from the international market and retire them in the Japanese national registry. The forecasted purchase of CERs, ERUs, and AAUs, by mainly private utility companies, is expected to be, at the most, 320 million t-CO2. Therefore, the total Japanese acquisition of Kyoto units is up to 420 million t-CO2. In fact, for the first two years of the Kyoto Protocol, 2008 and 2009, the required amount of Kyoto units were far less than the originally estimated due to the substantial reduction of actual GHG emissions for these years, making more than 100 million t-CO2 surplus of the Kyoto units.

After the earthquake and associated Fukushima nuclear accident, GHG emissions will be substantially affected due to suspension of nuclear power stations and subsequent economic activities. However, the amount of Kyoto units originally planned (420 million t-CO2 at the maximum) will likely be enough to comply with the Kyoto target. This is because the emission reductions were large enough, during 2008 and 2009, to compensate for additionally required amounts of Kyoto units for the ensuing period (2010, 2011 and 2012) caused by the unpredicted increase in fossil fuel consumptions by power stations (IEEJ, 2011).

The Japanese government will not ratify the Kyoto protocol post-2012. Therefore, Japan may no longer be able to acquire the Kyoto units from the international market since it may lose eligibility to use the Kyoto mechanisms (Takamura, 2011).

Without ratifying the 2nd Kyoto Protocol, Japan recognizes its need for compliance of the GHG emission reduction target under UNFCCC, rather than the Kyoto Protocol. The current 25% reduction target (compared to 1990 level as declared in COP15 and COP16) might be revised due to the earthquake and subsequent nuclear accident but a general consensus exists that international carbon credits are necessary for Japan to achieve the emission reduction target under UNFCCC.

To achieve a 25% reduction target, Japan may consider a bilateral offsetting credit mechanism (BOCM) as internationally acceptable credit (MoE, 2011a). For the FY2011, the Japanese government’s Ministries of the Environment (MoE) and Economy, Trade and Industry (METI) has been given a US $ 50 billion budget to conduct BOCM feasibility studies (GEC, 2011). So far, fifty - five projects have been selected.

BOCM’s structure is still convertible, and is somewhat similar to CDM, with at least three major differences. First, BOCM should be simple and flexible enough so that emission reduction activities are further encouraged rather than discouraged (as often happens in CDM described in IGES (2010)). Second, BOCM administration should be controlled by countries with GHG project involvement instead of with the UNFCCC Secretariat like in CDM in a centralized manner. Thirdly, BOCM’s scope should expand beyond CDM which has not explored such areas as energy efficiency in processes, products and transportation. However, BOCM would not necessarily replace CDM; BOCM will complement CDM and other existing frameworks under UNFCCC.
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Possibly, Japan will attempt to meet its GHG emission target in 2020 under UNFCCC by partially using international credits generated by BOCM and may or may not permit Kyoto units to be used for compliance. This decision will highly depend on how Japan successfully incorporates BOCM as an accountable credit into the international agreement at COP17 and subsequent meetings. Actually, forecasting the success of BOCM is difficult.

Since Japan is the fifth largest CO2 emitter in the world (IEA, 2010), a market for BOCM in a post 2012 framework could be large. In order for BOCM to achieve a 10% GHG reduction by 2020, it is estimated that over 100 million t-CO2 of BOCM credits would be required annually. The potential demand for Kyoto units from industrialized countries is estimated at 280 million t-CO2 (World Bank, 2011). Therefore, the international carbon market of Japan after 2012 could be largely characterized by BOCM.

3. Domestic Emissions Trading at the National Level

3.1. Compulsory Cap-and-Trade

After their takeover in 2009, the Democratic Party endorsed an immediate introduction of a compulsory cap-and-trade scheme to meet the 25% emissions reduction target for 2020 (DPJ, 2009).

From July 2009 to June 2010, the Japanese government, particularly Ministry of the Environment (MoE) rushed to establish a compulsory cap-and-trade scheme. After a series of intensive discussions at the committee on cap-and-trade, an interim report was published to sketch out the design of the scheme (MoE, 2010). Concomitantly, “The Bill of the Basic Act on Global Warming Countermeasures” which included an immediate introduction of a compulsory cap-and-trade scheme, was submitted into the Diet at the beginning of 2010 (Government of Japan, 2010).

However, with the resignation of Prime Minister Hatoyama in June 2010 and the defeat of the Democratic Party in July 2010, an immediate introduction of a compulsory cap-and-trade was terminated. This termination followed the decision of a Ministerial Committee on Global Warming in December 2010 which led compulsory cap-and-trade to an “under-discussion” category creating possible scheme suspension for the immediate future.

For the next few years, climate change policy may be somewhat integrated into energy policies such as energy conservation and renewable energy promotion reflecting a strong recognition by Japanese people that restructuring of energy supply and usage is necessary after the severe power shortage caused by the nuclear accident.

These recent events bring into question: when would a compulsory cap-and-trade scheme begin in Japan? Introduction could be when one of the following occurs:

a) EU, US and other major GHG emitting countries introduce a compulsory cap-and-trade at national level thus creating a “real” global carbon market.

b) Climate change actually causes very significant disasters and disrupts daily life and the economy, creating a perception that immediate GHG emission reduction is absolutely urgent and leading to strong political will to introduce tougher measures.

c) The electricity industry, which is currently vertically integrated and virtually monopolistic in Japan, is separated-out leading to a competitive market for generators. This is more likely to occur given the rapidly growing concerns for electricity supply reform after the nuclear accident in Fukushima.

None of a) - c) is fast-track and noteworthy. However, a competitive market for generators created by c) provides an ideal condition for cap-and-trade that has not been realised in Japan since 1939. One reason why the cap-and-trade scheme proposed by MoE (2010) excludes any power station as a direct participant (i.e. electricity is treated as indirect emission) is that the current market for generators is not competitive. The power sector is the biggest GHG emitter in Japan, currently occupying around 30% of the Japanese whole GHG emissions (GIO, 2010) implying that an inclusion of a power sector in a cap-and-trade is vital to expand coverage in economic activities. Therefore, if such restructuring of the electricity supply industry becomes reality (making a fully competitive market for generators) compulsory cap-and-trade may be paid attention to again as an effective measure to reduce GHG emissions from the power sector, which is very likely to increase due to a replacement of nuclear by fossil fuels 2011 onwards.

In any case, Japan has officially declared to reduce its GHG emissions by 60% to 80% - a tough target - in 2050 compared to the present level. Therefore, in the long-run, if not immediately, a compulsory cap-and-trade is likely to be introduced as one of the most effective measure to control GHG emissions.
3.2 Voluntary Cap-and-Trade

In place of a compulsory cap-and-trade scheme, two voluntary schemes have been developed in Japan. One is JVETS (Japan’s Voluntary Emissions Trading Scheme) which was created in 2005 and is led by Ministry of the Environment (MoE). The other is “an experimental introduction of an integrated domestic market for emissions trading (experimental scheme) and was initiated by Prime Minister Fukuda in 2008.

JVETS resulted in approximately 0.6 million t-CO2 emissions reductions in 2009. Generally, the achieved emissions reduction by JVETS is far less than that of EU-ETS. However, the importance of JVETS is not in the actual achieved emissions reductions but that it helped the development of infrastructure and knowledge for a cap-and-trade system. This infrastructure includes GHG monitoring & reporting guidelines, GHG verification guidelines, GHG reporting formats, and the creation of GHG verifiers who have created accreditation process and a registry system. All of these are necessary foundations for a compulsory cap-and-trade scheme which could never been developed without JVETS.

JVETS in Japan is likened to a “full-scale” compulsory cap-and-trade and would take an important infrastructure role after 2012 if no compulsory scheme is initiated.

In 2008, Mr. Fukuda chaired the G8 Hokkaido-Toyako Summit and initiated the experimental-scheme (as a part of the Cool Earth Promotion Programme) to evaluate emission trading scheme validity. The experimental scheme is similar to the “Keidanren voluntary action plan” in that participants choose personal targets with no penalties for non-compliance. The “experimental scheme” could potentially takeover JVETS since the number of the participants and the covered GHG emissions are much larger than those of JVETS. Additionally, the infrastructures of the experimental scheme including guidelines, rules and a registry system were primarily taken from JVETS.

However, drawbacks are inherent in the experimental-scheme. First, private MRV guidelines dominate leading to inconsistencies. Second, third-party verification is negated and reported GHG emissions values are not guaranteed. Third, free choice of GHG absolute target, GHG intensity target, energy absolute target and/or energy intensity target has led to incoherent results and the “experimental-scheme” permits emission allowances, not allocated initially, but distributed only when the GHG emissions are less than their targets, implying the scheme is similar to “baseline-and-credit” scheme. In the past two years, trades of allowances between the participants of the experimental-scheme have not often occurred.

Currently, the experimental-scheme is not a fundamental basis for a compulsory cap-and-trade scheme. Furthermore, the experimental scheme may not take an important role in Japanese carbon markets post-2012. This implies that JVETS, or its successor, would remain a voluntary cap-and-trade in Japan. Given a lower likelihood of an immediate introduction of a compulsory cap-and-trade at national level, a voluntary cap-and-trade is likely to continue after 2012.

4. Voluntary Carbon Offsets

Currently, there is a market for various carbon credits such as CERs, J-VER and “domestic credit scheme” being used for voluntary carbon offsetting activities. J-VER and the domestic credit scheme have been led by MoE and METI, respectively, since 2008. J-VER is particularly designed for voluntary carbon offsetting in general based upon a series of guidelines for such activities, published by MoE (Toda, 2010). 133 projects have been registered, producing around 126 kt-CO2 of issued J-VER credits to date. On the other hand, the primary objective of the domestic credit scheme is carbon offsetting as a part of the GHG emission targets set by the Keidanren’s voluntary action plan. It is estimated that 150 kt-CO2 of credits have been issued under this scheme. It is possible that the “domestic credit scheme” and J-VER could merge in coming years.

Without compulsory cap-and-trade, Japanese carbon offsetting activities should grow after 2012 because of pressure on corporations to prove “greenness.” MoE (2011b) estimates that the current level of carbon offsetting activities of 437 kt-CO2 p.a. seems to be too low compared to the emission reduction potentials in this country, implying that the demand for CERs, J-VER and domestic credit scheme could grow. For further promotion of carbon offsetting, MoE has just launched a “carbon neutral certification scheme” to encourage MRV of GHG emissions of private sector to be offset by carbon credits such as J-VER and domestic credits (MoE, 2011c). However, even when carbon offsetting is growing faster after 2012, the market for such activities is unlikely to be expand as much as it would if a compulsory cap-and-trade was implemented at the national level.

1Actually only a single transaction for “1 t-CO2” of allowance between the participants has been recorded since the scheme started in 2008.
5. Local Government Initiative for Emissions Trading

The Tokyo Metropolitan Government (TMG) launched the TMG emission trading scheme (TMG-ETS) in 2010. In addition, the neighborhood prefecture, Saitama, just north of Tokyo, also launched a similar scheme in the beginning of this year which is expected to link with TMG-ETS. These types of local governments’ initiatives could be further expanded after 2012 supposing in the absence of national compulsory cap-and-trade.

Technically, both schemes are not cap-and-trade. Similar to “the experimental-scheme”, emission allowances are not allocated to the participants at the beginning of the compliance period. Instead, the participants can obtain “tradable credits” as a difference between the verified CO2 emissions over the compliance period (2010-2014: 5 years for TMG-ETS) and their targeted emission levels for the same period. Therefore, they can be considered as kinds of “baseline-and-credit” schemes with a “loose target” since a penalty is applied for non-compliance participants in TMG-ETS.

Consequently, trade of allowances between participants will not occur until the compliance period ends (2015 for TMG; 2016 for Saitama). Therefore, it is too early to refer to figures of carbon markets for TMG-ETS and Saitama ETS. Since the CO2 emissions from the covered entities are counted for 12 million t-CO2 p.a., which occupies about 1% of all of Japan’s GHG emissions and the target settings for the 1st commitment period are quite challenging values of 6 - 8% reduction compared to the base-year emission of any continuous three-years average between 2002 to 2007, it is expected that a relatively active carbon market could appear after 2014. However, it is also worth noting that, with the even tougher target of 17% reduction for the 2nd commitment period between 2015-2019 compared to the same base-year emission for the 1st commitment period, many of the participants may choose “banking” rather than “selling” when they have any tradable credits during the 1st commitment period.

Again, it is very certain that at least two compulsory ETS led by two major local governments will continue after 2012. Currently, the exact impact of these schemes on the carbon market is not foreseeable. However, if a compulsory cap-and-trade at national level is absent after 2012, the role of these local governments’ initiatives will be increasingly important in developing a carbon market in Japan.

6. Conclusion

Presently, there are substantial ambiguities in the situation of a Japanese carbon market since a new international framework after 2012 is still under discussion. Due to a paucity of information, this paper has conjectured the state of carbon markets in Japan after 2012. Important points can be summarized as follows:

First, the international credit market after 2012 can be substantially changed since Japan is not ratifying a second Kyoto Protocol. Currently, Japan is exploring the possibilities of a bilateral offsetting credit mechanism (BOCM) to complement the existing Kyoto mechanisms that are being used for achieving 2020 GHG emissions targets under the UNFCCC. Second, introduction of a compulsory national cap-and-trade is unlikely, at least for the next a few years. Instead, a voluntary cap-and-trade scheme, like JVETS or other successive scheme, would continuously take an important role as a basis of a compulsory scheme. Third, voluntary carbon offsetting activities are likely to grow faster after 2012, since private companies encourage this in the absence of a compulsory cap-and-trade. Fourth, local government initiatives for emission trading, like TMG-ETS and Saitama-ETS, can take a leading role for development of a carbon market in Japan after 2012, although, the exact impact cannot be foreseen at this moment.

Overall, the carbon market in Japan after 2012 will likely evolve as BOCM, carbon offsetting and TMG/Saitama-ETS mechanisms are explored and introduced. The situation of the market may not be excellent, but Japan is still on the way towards implementing a compulsory cap-and-trade scheme.
References


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The Institute for Global Environmental Strategies (IGES) is an international research institute conducting practical and innovative research for realising sustainable development in the Asia-Pacific region. The IGES Market Mechanism Group conducts research to support the effective introduction and implementation of market mechanism by providing straightforward and useful information to the business community, and will contribute to practical policy making by conveying the viewpoint of affected businesses to policy makers.
Introduction
At COP 15 in Copenhagen, Japan committed to reducing GHG emissions 25% from 1990 levels by 2020. However, post-2012, Japan does not plan to purchase offsets through the Clean Development Mechanism (CDM) to progress towards this goal. A Bilateral Offset Mechanism (BOCM) has been proposed. While significant advances in bilateral negotiations and pilot offset projects have been made, there are still significant barriers that may impede the implementation of a BOCM. This paper examines the impetus for BOCM, assesses progress made towards BOCM and identifies barriers to the BOCM.

Japan's Commitment
On 16th, September, 2009, Yukio Hatoyama was elected Prime Minister from Japan, marking the first time a member from the Democratic Party of Japan (DPJ) was elected. The DPJ is more concerned with climate change than the Liberal Democratic and other former ruling parties. Therefore, after the election, prospects for Japanese climate change policy changed.

At COP 15 in Copenhagen, Prime Minister Hatoyama committed to reducing Japan's GHG emissions by 25% from 1990 levels by 2020. Although not stated explicitly, it is assumed that international offset credits will be used to achieve the majority of Japan's reduction commitment. Hence, Japan's climate change policy is a mixture of domestic and international emissions reductions, the latter occurring primarily through private investments.

The Basic Law
Following this commitment, on 12 March 2010, a draft of the Basic Law on Climate Change Countermeasures (Basic Law) was approved in a Cabinet meeting. This draft states that:

a. GHG emissions shall be reduced by 25% in 2020 compared to 1990 levels,
b. The proportion of primary energy supply provided by renewable energy shall be increased to 10%,
c. A domestic, compulsory emissions trading scheme (ETS) shall be adopted.

This draft law was submitted to the Diet (National assembly) of Japan and was passed in the Lower House. However, it was canceled during discussions in the Upper House due to the sudden resignation of Prime Minister Hatoyama on 2 June 2010.

On 2 September 2011, Yoshihiko Noda was elected as the new Prime Minister. Regarding climate change policy, Prime Minister Noda is expected to follow in the footsteps of former Prime Minister Hatoyama and Kan. However, Prime Minister Noda is likely to review mid and long term energy policy because the Japanese economy has been seriously impacted by the Great East Earthquake and the resulting nuclear accidents caused by the tsunami. Importantly, Prime Minister Noda stated that, in order to restore Japan's economy, the new government will have more dialogue with industrial groups than before; climate change policy has already been affected by this new approach. Specifically, the impact of climate policy on international competitiveness has been emphasized. As a result, climate change policy has become a more politically sensitive issue.

Sluggish economic growth and concerns from the global financial crisis have further fueled concerns with climate change policy. Important, some members of parliament and industrial groups believe the 25% reduction commitment should be amended. Given all of these concerns, it is clear that if a 25% reduction would have to be achieved primarily by offset credits from international suppliers as international reductions are much less expensive than domestic reductions.

Japanese Bilateral Offsets Credit Schemes
The Japanese government has proposed implementing BOCM between developing countries and Japan as one of the measures to achieve its 25% reduction commitment. An effective offsets scheme is imperative as it is highly unlikely that Japan's commitment could be met using domestic measures only. However, the Japanese government does not favor using the CDM as a credit supply mechanism because it is complicated, unpredictable and has not provided enough support for energy efficiency projects. Therefore, the Japanese government proposed the priority of BOCM over the CDM as offset credit mechanism.

There is strong support and weaker opposition for BOCM. Specifically, Nippon Keidanren - an influential economic organization with more than 1,600 members - supports BOCM. Many of Nippon Keidanren's members believe BOCM can support their energy efficiency and renewable energy projects by providing extra cash flows. Opponents to the BOCM,
mostly non-profit organizations, have many opinions and concerns: that the BOCM is not part of an international framework; that BOCM projects may be non-additional; that nuclear and coal offset projects should not be eligible offsets; trade distortions may occur; and domestic reductions may be discouraged. However, NGO’s opinions are generally divided and do not strongly influence public opinion. Additionally, many NGOs support the 25% reduction commitment.

Although the specifics of BOCM are still unclear, there are three distinct steps that must be taken to implement BOCM. These include:

1st: Creating a government-to-government framework agreement
2nd: Governments, public and/or private sectors in both countries jointly-implementing offset projects.
3rd: Transferring the reduction credits to Japan; surrendering credits for compliance.

Currently, government officials are actively negotiating, or have plans to negotiate, with Vietnam, Indonesia and India concerning BOCM. In the future, Japan may begin additional negotiations with countries such as Cambodia and Thailand. Although Japan and China have discussed the possibility of a BOCM, neither country has made any commitments. Still, it is clear that China has great emissions reduction potential and that Japanese companies are interested in the market.

Progress on current and pending negotiations has differed. Framework negotiations, following top-level confirmation/agreement with Vietnam are the most advanced with specific offset sectors and technologies, and monitoring, reporting and verification (MRV) issues being discussed. Negotiations with Indonesia have begun but have not yet occurred between top-level confirmation/agreement. Expert negotiations with India and Vietnam are slated to begin in late October 2011.

The Japanese government, however, is not waiting for bilateral agreements before commencing pilot projects. The Ministry of Economy, Trade and Industry of Japan (METI) and the Ministry of Environment of Japan (MOE) are laying the groundwork for a BOCM by supporting feasibility studies for international offset projects. In 2010, METI supported thirty projects and MOE supported three projects. These projects included industrial energy efficiency projects, diffusion of high energy efficiency appliances, high energy power generation, renewable energy use and forest conservation (REDD+). In 2011, the program was drastically expanded by the Japanese government. Specifically, METI increased the budget for its feasibility program by seven times. Additionally, MOE is supporting thirty-five projects of which twenty-nine projects are BOCM and six projects are CDM/JI. These feasibility programs are laying the groundwork for MRV and registry practices in developing countries.

Barriers to Japanese Bilateral Offset Crediting Schemes

Several barriers to implementing a BOCM program exist including

- concerns over international acceptance of BOCM credits,
- uncertainty regarding a domestic Japanese emissions trading scheme (J-ETS),
- pricing mechanisms for offset projects,
- MRV issues and
- uncertainty regarding using CDM credits for compliance in Japan.

The most substantial barrier to BOCM implementation is whether the international community will allow BOCM credits to be used for achieving Japan’s reduction commitment. If these credits are not “accepted” or “recognized”, private companies might be hesitant to make substantial investments in projects that depend heavily on the cash flow generated by these credits.

Project investment cost may not be covered by the revenue from BOCM credits, therefore Japanese companies seeking for having public finance, such as JBICs finance, which covers the initial investment cost.

A J-ETS is due to start within a year after the approval of the Basic Law. However, deliberation in the Diet has been delayed by the political turbulence after the Great East Japan Earthquake. Without confirmation of a Japanese ETS, the need for a BOCM will not be guaranteed.

Regarding the pricing of offsets, some government officials thought that a “reduction” should be transferred to Japan free of charge because Japan provides the technology and funding to an international offsets project. Now, it is obvious that Japan will pay for the carbon reductions from an offset project. However, the exact pricing mechanism that would be implemented is unclear; this prevents the realization of a BOCM. Options for a pricing mechanism are being considered including payment on a project-to-project basis and an auctioning system. Generally, the price of a BCOM credit is expected to be lower than the current price of CDM credits.
A comprehensive and consistent system MRV has not been developed. Therefore, it is likely that MOE or METI will need to set up a committee and devise such a system before a BOCM is realized. Currently, companies participating in feasibility studies are using J-MRV references for energy related projects and Voluntary Carbon Standard references for REDD+ projects. MOE has broad experience in technical assistance for capacity building in MRV, emissions registries and staff training; hence, it provides a good platform to share experiences and implement a BCOM in the future.

While Japan will not likely link in any regional or international market with other countries - the US or EU countries - who purchase offsets, government officials may allow CDM credits to be used for compliance in Japanese markets. This is a significant possibility; especially if not enough BCOM credits can be generated to achieve Japan’s reduction commitment.

**Conclusion**

BOCM has not been well known in the global carbon market or at the intergovernmental negotiation level until now. However, awareness and acceptance of the BOCM has gradually improved, particularly in developing Asia and the carbon market. According to JBIC’s interviews at Carbon EXPO 2011, over 70% of the respondents said the scheme would start before 2015 and 84% said they were interested in participating in the scheme. Barriers to overcome include the implementation of J-ETS and the securing of international acceptance or recognition that BOCM credits can be used towards Japan’s reduction commitment.

Both issues are correlated and the fast track to overcome these two issues is “purchasing by the government as pilot phase”. It would generate a big momentum for realizing BOCM.

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Mr. Hongo moved to Mitsui Global Strategic Studies Institute from Japan Bank for International Cooperation (JBIC). He is a member of many committees and study groups for national and local governments and active on the carbon market as well as environment related projects. He has initiated numerous carbon initiatives such as the Nikkei-JBIC Carbon Quotation Index, the first and only carbon price index in Japan, and “Performance-base Incentive System” as an application of J-MRV for transforming the incentive mechanism accelerating the shift to low carbon economy. He has contributed knowledge to the International Energy Agency, IPCC, UNEP and other UN institutions, as well as APEC and GLOBE International.
Introduction

With the climate negotiations moving at a sluggish pace over the last three annual global summits, attention is shifting towards energy and climate schemes in the major economies. Under pressure after other emerging economies announced domestic schemes, India announced a target reduction of carbon intensity of GDP by 20% to 25% of 2005 levels by 2020 in Copenhagen1. This reduction is to be achieved through India’s National Action Plan of Climate Change (NAPCC)2 consisting of eight missions launched in 2008. The given table summarizes the eight missions and their key targets.

The Perform, Achieve and Trade (PAT) scheme was announced as part of the National Mission for Enhanced Energy Efficiency (NMEEE). According to the emerging blueprint of the scheme, specific energy consumption (SEC) targets totaling to 10 million metric tons of oil equivalent (MTOE) by 2015 are to be fixed for large energy-using installations around the country and credits called Energy Saving Certificates or ESCerts issued for those exceeding the energy saving goals under the SEC targets. The credits can then be sold to installations which fail to meet their required cuts, thereby, over a period of time, enabling the formation of a new market-based mechanism.

The PAT Scheme has been divided into various phases which may be described diagrammatically as follows:

However, a number of the original deadlines shown in the diagram above have been postponed by the Bureau of Energy Efficiency (BEE), the nodal agency for designing and implementing the PAT scheme, For example, the monitoring and verification phase of the PAT Scheme was to start in April 2011 but is now due to begin only in second half of 2011.

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1 Available at: http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/indiacphaccord_app2.pdf
2 NAPPC available online at: india.gov.in/allimpfrms/alldocs/15651.doc

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<table>
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<tr>
<th>Eight Missions and their Key Targets</th>
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<tr>
<td><strong>Mission</strong></td>
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<tr>
<td>Jawaharlal Nehru National Solar Mission</td>
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<tr>
<td>National Mission for Enhanced Energy Efficiency</td>
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<td>National Mission on Sustainable Habitat</td>
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<td>National Water Mission</td>
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<td>National Mission for Sustaining the Himalayan Ecosystem</td>
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<td>National Mission for a “Green India”</td>
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<tr>
<td>National Mission for Sustainable Agriculture</td>
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<tr>
<td>National Mission on Strategic Knowledge for Climate Change</td>
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</tbody>
</table>
Asia Pacific Market On The Rise

The coordinating body, the Bureau of Energy Efficiency, with the assistance from German agency GTZ, will cover 477 odd installations in eight sectors – thermal power stations, cement, iron and steel, fertilizers, aluminum, chlor-alkali, paper and textiles. Together they account for 40 percent of India’s primary energy consumption (Table 1).

BEE has identified various industrial units which are very large energy consumers based on minimum annual energy consumption in various sectors, for example in the case of iron and steel it is 30,000 tons of oil equivalent. These units are referred to as Designated Consumers (DCs). The map shows the location of the DCs within the country. The highest numbers of DCs are located in Tamil Nadu (65) followed by Rajasthan (63) and Chhattisgarh (56). Originally the eight entities belonging to the India Railways were also listed, which were later removed considering the public value of the railways for the masses. Original figure of 714 DCs is likely to be revised to less than 500.

Specific Energy Consumption (SEC) was computed using the below formula following the principle of gate to gate accounting for a facility:

\[ \text{SEC} = \frac{\text{Total energy input to the plant boundary}}{\text{Quantity of the Key Product}} \]

For the purpose of setting the baseline the previous five years data was used and the arithmetic average was taken. Assessment of absolute energy saving at the end of 3 years (2011-2014) will be based on the following formula:

\[ \text{Energy Saving} = P_{\text{base year}} \times (\text{SEC}_{\text{base year}} - \text{SEC}_{\text{target year}}) \]

Energy Saving Certificates (ESCerts) will be issued by a Central Registry in case a facility exceeds reductions from baseline in target year (2014). The ESCerts will be traded among the designated industrial facilities on the following two exchanges: Indian Energy Exchange (IEX) and Power Exchange India Limited (PXIL).

### Table 1: India’s Primary Energy Consumption

<table>
<thead>
<tr>
<th>Sector</th>
<th>Million tons oil equivalent (in MTOE)</th>
<th>Share of energy use (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>160.30</td>
<td>69.5</td>
</tr>
<tr>
<td>Iron and steel</td>
<td>36.08</td>
<td>15.7</td>
</tr>
<tr>
<td>Cement</td>
<td>14.47</td>
<td>6.3</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>11.95</td>
<td>5.2</td>
</tr>
<tr>
<td>Textile</td>
<td>3.50</td>
<td>1.5</td>
</tr>
<tr>
<td>Aluminium</td>
<td>2.42</td>
<td>1.0</td>
</tr>
<tr>
<td>Paper</td>
<td>1.38</td>
<td>0.6</td>
</tr>
<tr>
<td>Chlor Alkali</td>
<td>0.43</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>230.53</td>
<td>100</td>
</tr>
</tbody>
</table>

\(^3\text{Deutsche Gesellschaft für Technische Zusammenarbeit GmbH}\)
**Targets Imply Less Rapid Reductions for Good Performers**

Best performers will have to improve efficiency by 1.5 per cent. The target goes up to seven per cent as inefficiency increases. The Bureau states that good performing DCs will get low targets and poor performing industries will get high targets. So, the targets will not result in uniform energy intensity within the sector.

**The Legal Update**

In August 2010, Parliament passed the amendment to incorporate PAT into the Energy Conservation Act 2001, thus providing legislative framework for the mechanism. The power ministry announced on January 2011 that electricity regulators in each state will ensure that defaulters are penalized. Industrial units will be penalized Rs 10,00,000 for non-compliance and an additional fine of Rs 10,000 for each day of default. This penalty will be over and above the monetary value of oil equivalent for energy target missed.

The state electricity regulatory commissions (SERCs), that came into existence after power sector reforms were brought about through the Electricity Act of 2003, have been entrusted as acting for adjudication. In May 2011, the Bureau communicated that they have finalized the efficiency norms and sent to the Ministry of Law for notification under the Act (Figure 12).

**Benefits of the Scheme**

According to a recent report by HSBC, the scheme to boost demand for energy efficiency products and services across the eight affected sectors. The BEE estimates that capital investments of INR208bn (cUSD4.6bn) will be needed in the first phase between 2011 and 2014. This will deliver annual energy savings of 6.7 mTTOE, worth around USD 2bn per annum. It is estimated that India’s total industrial energy market stood at USD 5.5bn in FY2009-10. Including PAT, it forecast that this segment will grow at a CAGR of 15% over the current decade (see Investing in India’s climate economy, 28 January 2011).

As stated earlier, companies that exceed their energy saving targets will be able to trade the surplus. Estimates suggest the size of this energy saving (ESCerts) trading market could be around USD200m by the end of Phase I. It is expected that trading will start in late 2012 once ESCerts (1 ESCert = 1 mTTOE of energy savings) are issued to DCs which overachieve their targets based on a review of their first year’s performance. BEE is still finalizing the details of the trading system, including whether an ESCert floor price is needed. The document is expected sometime in late 2011.

Over 70% of the targeted savings are expected to come from just two sectors: thermal power and iron and steel. Analysts believe that energy-efficient solutions for these sectors will offer the maximum investment opportunity, including process control and automation technology, efficient motors, pumps,
boilers, waste heat recovery, insulation material, variable frequency drives, blade fans, condensers, as well as capacitor banks.

The graph given alongside, estimates cost savings to various sectors under PAT till 2014. It is notable that the potential for cost saving is highest for thermal power sector.\(^5\)

**Potential Difficulties**

There are several potential difficulties with the proposed scheme. First, the PAT scheme is to be structured on the basis of benchmarking where historic SEC (energy used per unit of output) levels are monitored and targets fixed as slabs for each unit. However, the concept of unit-level benchmarking per se has attracted quite a lot of unease among policy makers worldwide. For example, SEC could vary widely across units based on different manufacturing processes, age of plants, plant size, capacity utilization levels and differences in raw materials. Even the extent of system boundaries selected could impact SECs.

However, considering India’s circumstances and a longer view, whether or not the scheme will help India shift towards the cleanest processes and plant sizes is a question that requires further examination.

To compound the issue, a number of out-dated public sector factories are to be linked with their private competitors. It could be that the public-sector units predominantly end-up buying credits generated from the private entities. Counter attempts by the BEE to soften targets for public-sector units would only create doubts about fair-play, lower the price of the certificate, or even upset the scheme altogether.

Second, as the scheme is devised on energy consumption alone, the benefits gained from CO2 emissions due to type of fuels is ignored. Thus units may not be able to utilize a low-carbon but expensive fuel like natural gas. It may be argued that use of such fuels depends on its availability and the necessary infrastructure, but discounting the higher environmental benefit may only harm the long-term transition towards low-carbon fuels.

Third, an upfront indicative price-band and mechanisms for price stability is still not and have precluded early market interest and build-up of resources. Financial returns on such investments would be calculated according to ECSert prices. There is also no information on whether the regulations will allow ECSerts to be traded in the secondary market that may enable financing from financial intermediaries.

Fourth, the potential issue of double counting with international carbon credits must be clarified. BEE states that through PAT, it is only concerned about the resulting energy savings attribute for the country. The issue of carbon credits is for the UNFCCC to decide.

\(^5\)In house research by Climate Connect
Hence, while the PAT scheme will definitely add to increased monitoring and verification of energy use in Indian industries, which is welcome, its ability to generate industry or market interest and the energy savings that will be achieved is still uncertain.

Climate Connect

is a news, data and research company based in London and New Delhi. Climate Connect was founded by experienced green market professionals in mid 2010 and has rapidly grown to build a highly qualified team of researchers and journalists. With the notion of a grand global carbon market finding few takers at the world stage, attention is increasingly turning towards domestic and regional environment markets in Asia, USA and Australia. At the same time, new initiatives like Aviation, CDM PoA and REDD+ are becoming part of existing climate mitigation regimes. Traditional renewable energy and energy efficiency initiatives are making a comeback with countries, especially in Asia, announcing policies related to them after taking voluntary commitments to reduce GHGs up to 2020.

Climate Connect is at the forefront of providing latest news on post-2012 climate policy and new emerging environment markets to clients across the globe with special focus on Asia.
Renewable Energy Certificates - Potential New Market Mechanism to Accelerate RE Promotion and GHG Emission Reduction

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Introduction

During the landmark UNFCCC conference held in December 2009 at Copenhagen, the parties, under the Copenhagen Accord, agreed to a non binding objective of limiting the increase in global temperature to two degrees celsius (2°C) above pre-industrial levels. Accordingly, developed countries (Annex I Parties) agreed to submit their commitment of economy-wide emissions targets for 2020 and developing nations (non-Annex I Parties) agreed to implement Nationally Appropriate Mitigation Actions (NAMAs) to slow down their carbon emissions growth. But, according to an IEA report1, if countries act upon these commitments in a cautious manner, rising demand for fossil fuels will continue to drive up energy related CO2 emissions. Such a trend would make it all but impossible to achieve the 2°C goal, as the required reductions in emissions after 2020 would be too steep. In that scenario, global emissions continue to rise through the projection period. This trend leads to stabilising the global concentration of Greenhouse Gases (GHGs) at over 650 ppm CO2 eq, resulting in a likely temperature rise of more than 3.5°C in the long term.

Although the 2007 Bali Action Plan, the Copenhagen Accord, and subsequent climate change agreements have all identified energy efficiency, renewable energy and technology innovation and transfer as key to tackling climate change, the promotion of these areas of sustainability is not taking place with the required pace.

Climate Change and Renewable Energy

In view of the large untapped potential for GHG emission reductions, renewable energy (RE) sources can play a major role in achieving emission reduction targets and in helping the world move onto a more secure, reliable and sustainable energy path. RE can greatly contribute to GHG emission reductions and help combat climate change. The need for government support to increase RE cost effectiveness is strongly envisaged. Now, considering the pace of growth of power generation from RE sources and the trend in RE purchase, a quantum jump in development of RE across the world is required. To achieve this quantum jump, a sustainable RE promotional market mechanism like Renewable Energy Certificates (RECs) needs to be implemented nationally.

Renewable Energy Certificates- Introduction

For the purpose of promotion of RE, there are several ‘Certificate Trading Schemes’ in operation in different parts of the world. Developed countries like UK, Denmark, Finland, Belgium, Netherlands, Australia, USA, Sweden, Italy are already practicing REC or similar mechanisms. The map below shows the countries with REC mechanisms4. India is the first among the developing nations to introduce such an initiative.

A majority of these countries gradually increase RE obligations annually by a certain percentage and have penalty provisions for power distributors who do not meet their obligation. Notably, in different countries the name of the mechanism is different, although the purpose is same. For example, in Denmark and Netherlands RECs are called Green Certificates, in Finland it is Eco labeled (Certified) electricity and in UK it is Renewable Obligation Certificates.

India REC Mechanism Development – A Case Study

Brief Review of Renewable Energy Project Incentives and Need of REC

Initially, India was one of the first countries in the world to actively promote RE on a commercial basis. Its efforts go way back into the early 80s when there was an emphasis on giving fiscal incentives. One of the main incentives used by the Government was accelerated depreciation. This incentive helped in the following ways:

- Generation of basic interest in industry segments for the RE projects
- Creation of manufacturing facilities
- Transfer of technologies
- Creation of first generation renewable energy manpower including technicians, engineers, entrepreneurs, policy makers, and administrators.
- Creation of data base of energy sources.

4Infraline Energy-REC-Stimulating RE Development
However, this incentive had its limitations. For example, it did not help new ventures or companies in the RE field. Additionally, while it was a good strategy to encourage RE in times of an economic boom it was not attractive in times when there was economic downturn. Also, it was a capital based incentive and therefore led to malpractices like over-invoicing. Lastly, efficiency of the equipment was not rewarded.

Apart from the depreciation benefit, the government also provided incentives like sales tax deferment and excise duty exemption. From the perspective of the government, both these incentives (accelerated depreciation and sales tax deferment) were affecting cash flow but did not really affect income. The industry perspective to RE started to change with rising energy costs; industry considered RE to be a serious alternative to fossil fuel based electricity generation.

The government was also faced with increasing pressure from the international community for carbon free electricity generation. This induced a sense of urgency in the government and it was realised that additional incentives were required. Specifically, the government realized that, to reach this goal, it had to leverage money from the private sector. This led to a change in instruments and more reasonable generation based incentives. Consequently, feed in tariffs and RECs were introduced. These incentives lead to generation of private capital to put up renewable energy generation and the burden of additional costs is ultimately shared by the consumers of electricity.

Overview of INDIA-REC Mechanism

The National Action Plan for Climate Change (NAPCC) envisages an increasing share of RE in total electricity consumption of the country. To catalyze the necessary development of RE in India, various policy instruments—including REC—have been listed in NAPCC. The Indian government announced the launch of a REC mechanism, the largest Domestic Carbon Market Initiative, in early 2011. The mechanism could become the essence of a future carbon market and will redefine RE sector growth in India.

REC is emerging as the largest incentive for investors in Indian RE and with two revenue streams—one from the sale of electricity and another from the REC mechanism—the Indian RE industry will be one of the most lucrative investment destinations globally. With a number of private investors keen on investing billions of dollars in Indian RE sector, the REC mechanism is now an integral part in planning further investments. Promotion of RE is a key criterion in the efforts undertaken to combat climate change.

With base year FY 2009-10 value of 5%, the target for RE purchase will increase by 1% every year for the next ten years. This implies that NAPCC foresees RE to constitute approximately 15% of the energy mix of India in 2020. In India, the RECs are to be issued for projects in the following sectors: biomass and municipal waste, wind, hydro and geothermal, bagasse cogeneration and solar. The government has fixed price
Asia Pacific Market On The Rise

bands for RECs in each of these sectors. However, RECs are not expected to hit these price bands.

India – Preleminary Analysis for REC and CDM Benefits

For project investors, it is important to know whether RECs could accrue more benefit to a project compared with any other mechanisms including the Clean Development Mechanism (CDM). India is the second largest country hosting the CDM in the world. Accordingly, RE projects account for 70% of CDM projects in India. Tradable REC, therefore, provides a new option for promoting RE electricity in India but it also poses a question how this would fit into the current market and co-exist with the CDM.

Although CDM has been criticized due to its lengthy and complex procedures for registration and issuance of credits, it is commercially supporting RE development. The CDM market has steadily grown to 8.3 billion Euro (12 billion USD) worth of transactions in the first half of 2011. Meanwhile, the REC trading has just started in February 2011 with total 2 million USD worth of transaction from seven transactions at the Indian Energy Exchange. It is hard to compare these two mechanisms at this stage due to different maturities of the markets. However, several distinct features, detailed in the following table, are worth considering in evaluating the future market value of each mechanism in India.

Both mechanisms are fully dependent on individual target levels for compliance. However, uncertainty on the future CDM market due to long lasting climate change negotiation currently overshadows any incentives for entering into the CDM. At the project level, upfront transaction costs is one of the key factors that project investors use to value the emerging market. RECs for solar power projects have been separately established despite very few exchanges; grid-connected solar projects are also relatively new to the CDM. It is essential that the mechanism of award for RECs requires some independent assessment. Otherwise, the mechanism is open for manipulation and malpractice. This may have the same effect as non-additional emission reductions have had in the CDM.

Although the initial price range for solar REC is quite high compared with the current CDM market, the price range is expected to continue to fall as costs of RE projects fall. This fall is likely as CERC has already announced to downgrade to 9,880-13,690 Rs/MWh from April 2012. Furthermore, there is no regulation to abandon application to both mechanisms, however, it is also important to note that it might become difficult to prove financial additionality, one of the key requirements of the CDM, if potential revenue of REC significantly improves a financial flow of project.

Conclusion and Way Forward

To combat climate change and to meet the goal of global temperature rise below 2°C, it is essential to implement various market mechanisms to stimulate GHG reductions. In an Asian context—where RE is one of the major potential sources of emission reductions—promotion and successful implementation of market mechanisms like RECs, that foster growth of RE projects, is of prime importance.

Given the successful track record of RECs mechanisms in advanced countries, introduction of RECs in India is an applause-worthy initiative that has the potential of solving the challenge of sustainability posed by constantly depleting fossil fuel sources. Furthermore, RECs shift the burden of subsidizing RE from the government to the actual polluter. Also, RECs enable a large number of stakeholders to purchase RE in

Table 1: Salient feature of REC and CDM

<table>
<thead>
<tr>
<th>Particulars</th>
<th>REC</th>
<th>CDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible projects</td>
<td>All renewable energy projects, but set for different price range only for solar</td>
<td>GHG emission reduction projects including, all renewable energy projects</td>
</tr>
<tr>
<td>Credit category</td>
<td>Two (solar REC/non-solar REC)</td>
<td>One for all renewable projects</td>
</tr>
<tr>
<td>Regulators</td>
<td>CERC (India)</td>
<td>CDM Executive Board, UNFCCC</td>
</tr>
<tr>
<td>Crediting period</td>
<td>10-year fixed or two-time renewable 7-year crediting period</td>
<td>7-year crediting period</td>
</tr>
<tr>
<td>Buyers</td>
<td>Domestic entities under the renewable Portfolio Obligations</td>
<td>International compliance buyers to the Kyoto Protocol</td>
</tr>
<tr>
<td>Prices</td>
<td>Price cap and floor effective from April 2012 *1,400-3,480 Rs/MWh for non-solar REC *9,880-13,690 Rs/MWh for solar REC</td>
<td>No caps *8.45-8.55 Euro for secondary CER Dec 2011/12 (Point Carbon)</td>
</tr>
<tr>
<td>Market certainty</td>
<td>Relatively stable *Recently issued the order to change the price range as well as its validity</td>
<td>Very uncertain *May not be applicable for a compliance buyer under the Phase 3 EU ETS</td>
</tr>
</tbody>
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a cost effective manner. In this view, it seems that RECs have
great potential for replication in Asian countries. According-
ly, country specific strategies and government policies have
to play a great role in implementing GHG mitigating initia-
tives like RECs. Such policies are necessary to move forward
on a global path towards sustainability.

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bon Market Program of the ADB, from last three plus years.
1 The 34th sessions of the Subsidiary Body for Implementation (SBI) and the Subsidiary Body for Scientific and Technological Advice (SBSTTA)

2 http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/01_bonn_presentation_-_canada_-_final.pdf


5 -17% below 2005 levels in 2020 (http://www.climatechange.gc.ca/default.asp?lang=En&n=DC025A76-1)

A Quick Glance at North America

to 845 Mt in 2020. This means Canada's gap could be 239 Mt in 2020.

Actions to close the gap are underway. Given that Canada is a federal where provinces have significant jurisdiction over environmental and energy policy; provinces have taken action to reduce emissions. Provincial and territorial governments in Canada also play a key role in reducing emissions and hold many levers for action on climate change. They have established their own climate change emissions reductions targets and are implementing GHG reduction strategies that reflect their individual circumstances. Current provincial and federal GHG policies could deliver about 65 Mt of reductions in 2020 (Figure 1):

- British Columbia’s carbon tax covers liquid fuels and large industrial emitters, or about 70% of the GHG inventory. Assuming the scheduled $30/tonne price in 2012 remains unchanged to 2020, the policy could deliver about a 3 Mt reduction in 2020.

- Alberta’s Specified Gas Emitter Regulations (2007) is a baseline and credit hybrid of cap-and-trade and carbon tax with a binding intensity standard of 12% improvement per year on large industrial emitters including oil and gas facilities. Compliance can be attained through buying or selling emission performance credits, compliance payments capped at CDN $15 to a technology investment fund, or with domestic offsets. Our modelling suggests reductions of about 9 Mt in 2020.

- Federal Passenger Automobile and Light Duty Truck Emissions Regulations require all new vehicles purchased after 2011 to achieve an emission standard of 348 grams of CO2e per mile travelled by 2016. In combination with this is a federal renewable fuel standard requiring 10% ethanol in gasoline. Our estimates are that these regulations could provide a 34 Mt reduction in 2020.

- Quebec’s Carbon Levy is a charge on liquid fuels applied at the refinery gate on gasoline and diesel fuel. The rate is 0.8 cents for each litre of gasoline distributed in Quebec and 0.938 cents for each litre of diesel fuel. This policy could deliver a 1 Mt reduction in 2020.

- Ontario is phasing out coal for thermal electricity by 2015, which will result in a net reduction of about 8 Mt in 2020.

To estimate the baseline and the emissions reductions below, we use the CIMS energy and emission model. CIMS is calibrated to historic Canadian energy demand and technology deployment and uses a forecast of future economic demand and energy prices for emission forecasting and policy scenario outcomes. It is maintained by researchers at Simon Fraser University.

9 Any facility in the province that emits more than 100,000 metric tons of CO2e of GHGs per year
• A series of energy efficiency and renewable electricity incentives across Canada, such as the federal government’s ecoEnergy initiatives, Ontario’s Feed-in Tariff and Nova Scotia’s renewable portfolio standard could deliver another 10 Mt reduction.

With these policies in place, the gap to Canada’s target in 2020 is in the order of 225 Mt, or about 74%. A number of federal and provincial policies are currently being designed that will contribute to further close the gap by a further 38 Mt:

• Western Climate Initiative (WCI) cap-and-trade. The State of California, and the governments of British Columbia, Ontario, Manitoba and Quebec, representing about 43% of Canada’s 2020 emissions, are currently developing the policy towards the implementation of a regional cap and trade system. Coverage of the system is to start with industrial emitters in 2013 and include liquid fuels in transport and buildings sometime thereafter. While it is not clear how the overall cap will be allocated between participating jurisdictions and emitters, or how flexibility mechanisms will be implemented. WCI modelling suggests an allowance price of $30 per tonne in 2020 as a good benchmark for estimating stringency. Applying this allowance price across liquid fuels and large emitters in Ontario and Quebec (we assume the BC carbon tax now covering industrials instead becomes covered under cap-and-trade) suggests emission reductions of about 18 Mt in 2020 from Quebec and Ontario.

• Federal performance regulations on coal fired thermal power plants. Early indications are that the Government of Canada’s greenhouse gas regulatory process will not seek to align stringency with the 2020 targets. Both the light duty vehicle regulations and the proposed coal fired regulations will only bind when new capital stock is deployed while existing stock is left unaffected. This means the majority of the emissions from existing stock will remain unaffected by policy. The proposed coal fired regulations, for example, will likely deliver only about 5 Mt of reductions in 2020 on the sector’s forecast emissions of 91 Mt (adjacent figure).

The average cost of these emission reductions is in the order of $25 per tonne, or about $260 million annually.

• Federal performance regulations on new and modified industrial energy users and producers. The federal government has announced it will regulate new sources in the oil and gas, chemicals, smelting, cement, iron and steel and mining sectors. While the proposed regulations are not available to assess at this time, applying a performance standard similar to the coal regulations (above) to new industrial sources likely to be deployed before 2020 indicates emission reductions of about another 15 Mt in 2020.

Putting this jumble of policies together indicates that Canada has in place or is readying policies to reduce emissions by about 103 Mt in 2020, leaving a gap of 136 Mt (or 57%) of the 2005 target (Figure 2). The stringency placed on Canadian emitters is not that out of line with European carbon prices, with a European Union carbon price under the Emission Trading System (EU-ETS) currently at about $17 Canadian per tonne.\footnote{EU ETS allowance price as of July 21st was 12.77 Euros, which is equivalent to CDN $17.33.} Seventy percent of emissions in British Columbia currently face carbon prices of CDN $25 per tonne which will certainly increase by 2020, while industrial energy users and producers in Alberta face a price of CDN $15 per tonne. Currently federal coal fired power regulations will impose a...
A Quick Glance at North America

A carbon price on emitters closer to CDN $25 per tonne between now and 2020. While internationally Canada is seen by some as a GHG mitigation laggard due to a history of federal inaction, there is in fact more mitigation to occur than Canada’s reputation would imply.

**Future Policy Directions**

The question then is how to continue to reduce emissions so as to move towards Canada’s longer-term aspirations. For now, it is politically not feasible to implement national carbon pricing, but with movement at the provincial level and with an eye on cost-effective reductions greater than current policy can deliver, the movement to carbon pricing is necessary. While British Columbia’s carbon tax has been successful, the preference for cap-and-trade under the WCI and within Alberta’s GHG regulations, representing of the majority of Canada’s 2020 emissions, indicates momentum towards allowance trading in the longer-term.

A critical policy question is then how to harmonize provincial and federal systems so that they ultimately align with Canada’s longer-term mitigation aspirations. In looking forward, a number of opportunities exist to prepare for emissions trading:

1. Federal regulations should be designed to transition to carbon pricing. Ultimately with deeper emission reductions constraints, more flexibility to enable cost-effective reductions will be needed in federal carbon policy. Practically, this means that the performance regulations, which are really intensity benchmarks by industry, need to be designed with a longer term view to transition to carbon pricing as regulatory costs climb. A strategy moving forward would be to transition from the intensity based performance standards to a cap and trade regime allocating allowances on emission intensity.

2. Domestic offsets need to be established. With the current federal regulatory approach and provincial actions delivering at best half of the aspirational targets of the federal government, offsets will likely form an important compliance option. Developing offset rules and offset projects take time, and as such the federal government will need to signal early that offsets have a role in future compliance. This will set expectations necessary for offsets markets to develop.

3. Move to Enable International Offsets. While it is not clear what the post-2012 Kyoto world will look like, early indications are that project based CDM could be complemented by reductions from REDD+ and from Nationally Appropriate Mitigation Actions (NAMAs) in the developing world. While it is not clear where in the post-2012 architecture NAMAs and REDD+ will fit, or CDM for that matter, the current momentum points to their use in future developing world compliance. Moving forward to support both REDD+ and NAMAs would prepare Canada to access lost cost reductions internationally. Still, in the absence of this shift towards a formal UNFCCC process for international offsets, there is scope for Canada to move bilaterally in search of international mitigation opportunities.

**Conclusion**

Canada’s climate policy is a jumble of policies spread across sub-national jurisdictions with a federal sector by sector regulatory approach emerging. This is not surprising given that Canada is a federation where provinces have jurisdiction over a diverse range of energy issues. But the view from Canada is that the inactivity at the federal level has drawn attention away from efforts of provinces to mitigate GHGs. Now that the federal government is moving to regulate carbon, the challenge will be to unify the very different federal and provincial actions to deliver cost-effective reductions across Canada’s entire emission inventory in the long-term. This becomes more
important as policies start to bind and costs rise as increasing stringency is sought. As the limitation of national performance regulations are likely to be revealed, in terms of both low reductions and high costs, additional flexibility mechanisms will be needed. Most likely the future will require a movement to cap-and-trade, with access to domestic and international offsets. The challenge of a forward looking climate policy is to anticipate how the jumble of climate policies can be transitioned to deliver cost-effective reductions. These reductions will need to be aligned with Canada’s aspirational GHG reduction targets, while keeping compliance costs aligned with major trading partners.

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California in 2013 intends to put in place the United States’ first economy-wide emissions trading system, targeting covered entities in the electricity, industry, and transportation sectors that emit more than 25,000 tons of greenhouse gases per year. The program is just one component of the state’s pioneering AB 32 legislation. It is also the most recent program to become part of a legacy to do more with less energy— which began the last time Jerry Brown was Governor, in the 1970s.

This year, AB 32 is advancing—but several issues continue to evolve that could have serious implications for carbon market formation in California.

Offsets and supply-demand dynamics

The basic supply and demand dynamics of the allowance market are fairly well understood. In one of its summer announcements, California recalibrated its emissions baseline for covered sources—lowering the amount of allowances available to reflect the results of the economic recession. But the basic areas of coverage remained unchanged.

The provisions on offsets continue to take shape. One unintended consequence of California’s decades of leadership in promoting energy efficiency and renewables is that inexpensive, in-state reductions are costly. Moreover, AB 32 regulates many other sources of low-cost offsets, so they will not be additional.

Still, offsets are essential to containing the total costs of California’s emissions trading system. The Air Resources Board’s (ARB) economic models show that if offsets supply is halved, then allowance prices may double.

With the need for supply being a first priority, California intends to look beyond its boundaries for adequate supplies of offsets. Links will be made to Western Climate Initiative (WCI) partners for allowances and offsets. In addition, the program aims to attract high-quality offsets from other states as well as countries with low cost sectoral and forestry offsets. California already has Memorandums of Understanding to explore such crediting systems with Acre, Brazil and Chiapas, Mexico.

However, some provisions in California’s most recent round of rules on market oversight and offsets, as well as ongoing litigation and political pressures, make it unclear whether California will have a robust supply of high-quality offsets. This year’s litigation was motivated primarily by groups worried that large regulated entities in disadvantaged areas would purchase offsets instead of directly reducing carbon emissions. They prefer to force more carbon reductions on-site, in hopes that it will drive further reductions in local air pollutants as well. Their primary worries are not about climate change—but are about the impacts of other emissions on the health of local populations near industrial facilities. Even though local air pollution is controlled by other provisions of the federal Clean Air Act, these groups are unsatisfied with progress. The groups may be small, but they are vocal and organized.

ARB’s decision to delay program implementation by one year will reduce offset demand in the first compliance period. On the other hand, its decision to ease offsets limits from 4% to 8% of an entity’s compliance obligation will increase offsets demand over the decade. As noted previously, California’s pending regulation of some potential sources, such as of landfill methane, will rule out potential supplies from such sources, both in and out of the state. ARB regulators are reluctant to move forward with new offset protocols that may appear to unfairly disadvantage regulated, in-state producers, so no offsets are allowed from sources that would be regulated in California.

Buyer Liability

Another potential supply bottleneck arises from ARB’s decision to make offset buyers liable in the event that the reduction is invalidated due to problems that may be discovered in the future. For example, a regulator could complete review, approval and issuance procedures properly, and a firm could then tender the offset for compliance. But the regulator could still invalidate the offset years later, if it discovers that an overstatement or unlawful activity related to the offset’s development or use occurred.

Many IETA members have raised concerns about the market consequences of such a provision. In ARB’s recent rule revisions that were open for 15 day comments (the “15 day” rules), it announced successive changes to improve the liability provisions. ARBs new proposed rule states that if companies opt to get a second third-party verification on an offsets issuance request, then invalidation can occur only during the first three years after issuance for an ODS project or
during the first three reporting periods for any of the other current project types.

Although this solution provides some comfort to market participants, it will come at the cost of creating multiple tiers of offset pricing, relating to the length of exposure to this regulatory risk. ARB has made these changes in their belief that insurance or structured products will emerge to manage the exposures to this risk, and it is an open question how this regulatory risk will be recognized in the rules of the WCI partners. Specifically, how would a WCI partner’s government view it should one of their compliance entity’s offsets holdings were to be invalidated?

Even with the change, categories of offsets, such as forestry and agricultural sequestration, will subject to reversals for carbon releases from fire or other problems. This could mean that offset projects that permanently destroy greenhouse gases, for instance, coal mine methane, could become the “go-to” sources over others that are subject to reversal or characterized by greater measurement uncertainty. In any event, the buyer liability approach will increase transactions costs across the full suite of offsets, and the costs will be borne ultimately by consumers.

To the positive, on the supply side, ARB has approved four offset protocols: forestry, urban forestry, ozone depleting substances, and livestock methane. It also announced potential approval of protocols for conversion of pneumatic controllers, reduction of N2O from fertilizer, and from rice management to bolster supply of early offsets. Mindful of ‘not-invented here’ concerns to favor in-state offset supplies, ARB is considering in its next tranche offsets that favor in-state sources such as rice (although Arkansas now ranks first among six states as the nation’s largest rice producer, accounting for 48% of all rice supplied).

**Linkage to WCI**

Another issue that arises from potential offset provincialism is that linkage to WCI partners—which is vital for environmental effectiveness and efficiency of the market—will bring out-of-state offset sources into the system, regardless. A recent study examining the electricity sector found that allowance prices were most costly under a system limited to California ($103 per ton versus $21 per ton) than a system including the WCI states (Palmer, Burtraw and Paul 2009).

Related to concerns about ongoing litigation, state attorneys are skittish about enforcing out-of-state offset sources. The “enforceability” requirement is a new and untested criteria for offsets.

In addition, California plans to impose a set of market oversight rules in concert with the Commodity Futures Trading Commission rules on carbon futures. At the state level, there are no easy corollaries to federal agencies such as the Securities and Exchange Commission (SEC) and the US Commodity Futures Trading Commission (CFTC). California’s ARB intends to impose purchase limits at auctions and holding limits for traders in order to guard against market manipulation and excessive speculation. It also plans to impose training and licensing requirements for traders, and safeguards against fraud.

California’s WCI partners are also considering market oversight regulations. Given the differences in state-federal jurisdiction over such issues in Canada, it is possible that Canadian firms will face lighter regulations.

On the other hand, New Mexico’s cap and trade legislation imposes an even stricter form of buyer liability that exposes offset purchasers to invalidation with no safe harbor. Admittedly, the New Mexico program is facing a high risk of reversal from its new governor, Susana Martinez, who pledged to dismantle the program. Still, the existing New Mexico’s law states that the Environmental Department must ensure that other states and provinces have comparable market oversight rules in order to allow linkage. California and other WCI partners have similar provisions. Thankfully, WCI members are attempting to coordinate policies on market oversight. But it is unclear at this point how they may resolve differences – and how the various rules will effect market formation in the WCI.

**International Linkages**

International linkage to sectoral or REDD systems could be extremely important to California’s cost containment system. AB 32 creates the theoretical potential of linkage to the EU ETS. But the systems have significant differences. California’s program has broader coverage (including transportation and it allows REDD offsets and sectoral credits from approved jurisdictions. Furthermore, it has a cost containment reserve available starting at $40 per allowance. In contrast, the EU ETS allows limited amounts of offsets from the Clean Development Mechanism (“CDM”), so long as they are from least developed countries - and potentially offsets from an international sectoral crediting system, which does not yet exist. However, the EU ETS contains no cost-containment reserve, and it does not allow REDD credits.

It is also unclear whether California is interested in linking to the EU ETS, which has traded at higher prices than are envisioned in AB 32’s economic models. Even if California wants to link to the EU ETS, it may not have Constitutional authority to enter an agreement with a group of sovereign nations.
On international offsets, former Governor Schwarzenegger was keen on linking to low cost, sectoral sources of offsets. At last year’s COP, he signed a high-profile commitment to link California’s market to forestry programs in Chiapas and Acre. Throughout his tenure, Gov. Schwarzenegger made overtures to link to Europe’s market.

The current Administration of Gov. Brown is guided by senior staff drawn from the Attorney General’s office, where Brown formerly served. Reportedly, the Governor’s staff has slowed down linking efforts, owing primarily to enforcement concerns - but also due to changing political winds. Some groups worry that international offset programs will drive social inequities in Chiapas or Acre. A larger number worry about the integrity and public relations image of CDM offsets allowed in the EU ETS system.

In California, concerns CDM offsets led to a push from environmental groups to limit international offsets to those produced from sectoral crediting systems – but there is no international agreement yet on how to structure sectoral systems and what form the credits will take.

**Market Consequences**

Carbon market professionals can expect the California market to face further refinements this fall, as additional details are released after the final “15 day” rules, ahead of the official submission of the regulation on October 28, 2011. During 2012 there will be additional review phases as the market gradually “goes live.”¹ For now, the most important developments influencing market formation are:

- Approval of new offset methodologies;
- Improved offsets limits;
- Improvement in buyer liability provisions;
- Market oversight systems; and
- International linkage decisions.

These issues are likely to force changes in carbon contracts and trading practices – but they could also produce a major boost to the credibility in the U.S. of using emissions trading mechanisms to address climate change.

¹ During the summer of 2011, Chairman Mary Nichols announced a ‘soft start’ to the program, whereby compliance obligations would not actually start until 2013, but the mechanisms and procedures would be adjusted during 2012. According, the final rules accepted in 2011 will still face adjustments before the ‘hard start’ of the program.
Voluntariness and Regulatory Threat: What Drives the Swiss Carbon Market and Where is it Heading?

Mischa Classen, Kristina Arnold, First Climate

Zooming in on EU ETS

Geographically locked-in within the European Union, Switzerland has kept its autonomy not only with regard to its political neutrality but also by choosing a unique way of regulating carbon emissions. Its approach has been centred on a mix of voluntary and customized measures blended with a shot of regulatory threat. Now the country stands at a crossroads and must decide whether to keep its unique system, join the European Union’s Emission Trading Scheme (ETS), or choose a hybrid policy model.

So what has been so special about how Switzerland has regulated its greenhouse gases (GHG) and what implications would a link-up with the European ETS have on both the country and the European carbon market?

**Swiss Peculiarities in Regulating Greenhouse Gases**

When Switzerland’s CO₂ law came into effect in May 2000, regulations stated that CO₂ emissions, Switzerland’s main greenhouse gas, were to be reduced by 10% by 2010 compared to 1990. The law differentiates between solid fossil fuels such as coal and liquid fossil fuels like natural gas for which different targets have been set: a 15% and 8% reduction respectively. A fundamental feature of Swiss legislation has been an emphasis on private economy’s initiative to “voluntarily” reduce GHG emissions. If these private measures prove ineffective, the state has the option of implementing a CO₂ tax on both solid and liquid fossil fuels. The regulation also allows for some flexibility, such as a Swiss emission trading scheme and the use of Kyoto regulated Certified Emission Reduction (CER) certificates.

As early as 2001, the Energy Agency of the Economy (EnAW) was established to help companies set and meet emissions reduction targets. Although the Agency motivated around 1500 companies to voluntarily reduce carbon emissions by 2007, the target of a 15% reduction in emissions from solid fossil fuels was not reached. Subsequently, a carbon tax was introduced in 2008. Initially set to 12 Swiss francs per tonne of CO₂, it was increased to 36 francs in 2010 as stipulated by law, which calls for a step-by-step increase of the taxation level in the event of missed reduction targets. Today, this level equals 0.9 Swiss francs per tonne of solid fossil fuel. Again, this tax is unique as it is a pure steering tax, which is re-distributed to both the population and the companies thereby fulfilling the sole purpose of forcing companies to price carbon costs into their decisions.

In parallel, in 2001, the automobile industry started discussing voluntary emission reduction measures. In order to prevent the industry from being hit with a similar carbon tax for its fossil fuel imports, it introduced in 2005 a “voluntary” carbon tax of 0.015 Swiss francs per litre of fuel that the consumer pays on its fuel bill. It also created the Climate Cent Foundation, assigned to manage the tax revenues in order to reduce carbon emissions by a minimum of 12 million tonnes CO₂ over the period 2008-2012 by purchasing CERs equivalent to 80% of the targeted reduction volume and by supporting domestic GHG emission reduction projects. These measures have allowed the automobile industry to avoid the introduction of a similar carbon tax.

**The Swiss Emission Trading Scheme**

The Swiss Emission Trading Scheme (ETS) came into play in 2008 after the carbon tax was introduced. The CO₂ law offers companies the option to bindingly commit to emission reduction targets and hereby participate in the Swiss Emission Trading Scheme in order to get exempted from paying the tax. Since then, all companies that have chosen exemption from the carbon tax, mainly large emitters such as cement, glass, ceramic, paper and chemical companies, receive emission rights allocated for free in accordance with targets that aimed at the 15% reduction while granting some flexibility for cases of hardship. Today, the Swiss National Allocation Plan (NAP) lists 431 companies as regulated under the Swiss ETS, with a total cap of 16.5 million tonnes of CO₂. With a CER quota of 8%, the maximum potential CER demand would result in 1.33 million CERs. However, the numbers provided in the NAP may still vary, as issuance in 2012 will be adjusted to reflect the impact of yet another Swiss particularity: the growth correction mechanism that consists of relative targets until 2010 that have since then been fixed for the remaining two years.

This leads to the question of why it has been so quiet on the Swiss carbon market. So far, no intra-company trade of Swiss emission allowances has been registered. There are two reasons for this. Firstly, until 2010 companies included in the ETS had agreed on relative emission reduction targets that were based on production levels. This created uncertainties with regard to whether the company was short or long and therefore most companies decided to wait to sell emission rights. Since 2010, the targets have been fixed. Secondly, ETS companies have been long over the past years by around 0.5 million tonnes per year according to recent figures from the Swiss En-
Swiss-EU ETS. Not bringing any major change in demand structures of a linked ETS remains the same: the Swiss participation will be limited in the Swiss scheme is dwarfed by the 2 billion EU-allowances. One of the strategic pillars that has been communicat-ed to date is the aim of linking the Swiss ETS with the Euro-pean ETS and to homologate both “carbon currencies” as of the beginning of the next trading period in 2013. The first for-mal negotiations began in March 2011.

Insecurities on the Swiss Carbon Market
The Swiss carbon market is now watching to see how the reg-ulator will solve remaining disagreements in the parliament in order to agree on the new CO2 law by the end of this year. As Reto Burkard of the Swiss environment ministry (Bundesamt für Umwelt, BAFU) explains, this may still be possible despite a very tough timeline. However, even when a final version of the successor CO2 law has been agreed, a long implementation process is waiting ahead that could create a regulatory gap be-tween the end of the current CO2 law on 31.12.2012 and the implementation of the new agreement.

It remains to be seen how the principles dominating cur-rent climate change legislation in Switzerland will survive in the new CO2 regulation, meaning the emphasis on voluntary measures, flexibility in terms of setting targets for individual companies and the focus on domestic emission reduc-tions. One of the strategic pillars that has been communicat-ed to date is the aim of linking the Swiss ETS with the Euro-pean ETS and to homologate both “carbon currencies” as of the beginning of the next trading period in 2013. The first for-mal negotiations began in March 2011.

Linking both emission trading markets will make for an une-qual marriage. Whereas the EU ETS regulates some 11,000 installations and industrial plants in 30 countries, covering around 50% of the EU’s CO2 emissions, the Swiss ETS cov-ers 431 companies, equalling roughly 7% of the country’s CO2 emissions. The annual 3 million tonnes of CO2 emissions reg-ulated in the Swiss scheme is dwarfed by the 2 billion EU-cap set for 2013. Apart from a much smaller number of in-stallations, this discrepancy comes from Switzerland’s nearly non-existent CO2 emissions from electricity production due to its high share of hydro and nuclear power generation. Al-though the Swiss ETS has only covered CO2 emissions from fossil fuels up to now, whereas the EU ETS looks at process emissions from CO2 plus a range of other GHGs, the result of a linked ETS remains the same: the Swiss participation will not bring any major change in demand structures of a linked Swiss-EU ETS.

Clearly, the bulk of changes are to be expected in the Swiss ETS. The environment ministry expects that leeway for main-taining Swiss-specific design features will all but disappear. These features include mainly the way emission rights are allo-cated; the threshold at which companies will be included into the ETS, and the monitoring rules and the flexibility that companies will have with regard to getting additional allow-ances in case of capacity changes. According to the ministry, European rules for free allocation based on the Benchmarking Decision will most probably be applied to Swiss firms as of 2013, despite negotiations on the linking not yet being final-ized. This implies that Swiss installations will face more rigid rules to determine their allocation where previously they nego-tiated their caps within the EnAW, depending on their po-tential for internal mitigation measures, and on capacity and production changes.

Open Questions About a Linked Emission Trading Scheme
One of the questions still open in the Swiss carbon market is how many and which companies will remain regulated un-der a joint scheme. The criteria for compulsory inclusion have not yet been determined and constitute a negotiation hurdle in the talks on linking. Currently, the Swiss environment minis-try has set the tentative inclusion level at 10 thousand tonnes CO2, which corresponds to 3 – 5 MW compared to the 20 MW in the EU. This means that in Switzerland much smaller installations would become subject to regulation than in the EU. Studies conclude that under current assumptions around 60 installations would join a linked scheme, while another 70 installations could choose to voluntarily opt-in. Applying the higher EU level, only 30 installations would be linked with the EU scheme. In the current draft of the revised Swiss CO2 regulations it is foreseen that remaining installations outside the ETS will still have the choice of voluntarily adopting re-duction targets – without participating in the ETS – or alter-natively paying the tax. Switzerland’s national regulation will hence remain a sort of hybrid policy model after 2012 where non-ETS sectors contribute - on a “voluntary” basis - to meet-ing the nation’s CO2 reduction goals.

However, a number of Swiss ETS installations are concerned about the changes and challenges of a planned linking to the EU ETS. A major source of concern is the level of the EU benchmarks set for post-2012 allocation of emission allow-ances. Small and specialised Swiss installations fear an uneven playing field when competing across the same bench-marks with the much larger EU installations. In many cas-es, big European facilities benefit from scale effects and yield lower specific emissions than their smaller Swiss counterparts. Also, many Swiss companies complain that they would enter the race in a linked scheme with a less comfortable allowance cushion than their European competitors. This is due to the fact that current compliance targets for Swiss companies have
been more stringent while taking into account internal emission reduction possibilities.

Uncertainties concerning a CER import quota for Swiss installations are also contributing to the unease towards the post-2012 linking. Would the current CER quota be extended to 2020 and how would previous voluntary measures be accounted for? It is equally difficult to estimate the potential CER demand from the Swiss ETS for the post-2012 compliance period. Under current assumptions, the Swiss NAP post-2012 could add up to an annual 6 million tonnes including not yet regulated installations and Greenhouse Gas emission sources. Assuming that the 8% CER import quota for the ongoing compliance period of 2008-12 extends to 2020 and newly regulated sectors would get a quota of 8% too, the absolute maximum CER demand could amount to 3 million CERs. Although tentative, this number shows that it would not affect the picture of existing supply-demand models in the EU ETS.

Another feature of today’s regulation in Switzerland is the focus on domestic emission reduction measures. The Climate Cent Foundation has been ordered to reduce 2 million tonnes out of the total 12 million tonnes CO₂ by supporting domestic emission reduction projects. The government also ruled in 2010 that newly built fossil fuel plants, such as combined cycle power plants, need to compensate for 70% of emissions with national emission reduction projects, while the remaining 30% can be covered by CERs to fulfill the obligation of being fully carbon neutral. The current draft legislation for the post-2012 Swiss carbon market includes covering a maximum of 50% of total emission reductions of the minus 20% target by 2020 (baseline 1990) with CERs, whereas the remaining share needs to be reduced by domestic measures. If the government decides to increase the reduction target to 40% in order to be consistent with international climate change agreements, 25% of these reductions need to happen domestically. This supports the expectation that the carbon market will tentatively not see any major demand in CERs from the Swiss market.

While most relevant details are not explicitly ruled at the level of the draft revised law, the concrete guidelines will emerge as the negotiations, including those on the implementation of the law, draw to an end. Currently two studies are underway to assess the effectiveness and effects of various policy options, namely on the level set for inclusion of Swiss installations into the ETS. The findings expected this summer will contribute to shaping the Swiss position in the negotiations for linking the schemes.

What remains clear, however, is that companies included in a linked ETS will profit from reduced costs for future compliance and have access to a large, liquid market with clear price information. The Swiss environment ministry estimates that incumbent installations could purchase allowances in a linked scheme at a discount of up to 15 euro compared to the isolated ETS scheme. Also, existing studies show that large emitters are better off in an ETS, compared to the alternative of paying the carbon tax.

It remains to be seen how the revised hybrid policy model will work after 2012 and how those installations without mandatory participation in the ETS will make use of the flexibility to either voluntarily opt into the ETS, adopt voluntary targets, or simply decide to pay the tax. The long-awaited decisions mid-2012 will leave the Swiss companies with a puzzling buffet of choices.

First Climate
is one of the leading carbon asset management companies. With its presence on five continents and ten years’ experience, it covers the entire carbon credit value chain. First Climate has a solid track record in the voluntary and compliance markets and is investment advisor to several carbon funds. It also offers carbon investment and renewable energy infrastructure opportunities for institutional investors.
“How Do You Make God Laugh? ... Write Down Your Plans” (Woody Allen)

It’s never easy trying to predict the future. Who would have been able to foresee in August 2007 that the second phase of the European Emissions Trading System (ETS) would be plagued by carousel fraud, theft and phishing and their consequent effect on volumes traded - first taking it to new heights, and then new lows - even paralysis?

It’s August 2011 as we write this and you are likely to be reading this in November of this year, so things might have changed, but recently, there have been a number of events, decisions and conditions that will have a very bearish influence on the European Carbon Market in Phase III. As an exchange our key role is to provide price discovery and liquidity to the market so that long term investment decisions can be made confident that they can be monetised at their conclusion. But this confidence for the investor will be severely put to the test as a number of things combine to undermine the price of carbon but even the importance of the Emissions Trading System as Europe’s primary tool to combat harmful emissions. We can identify these as: the failure to agree the tighter emission targets from the EU’s Low-Carbon Roadmap; the proposed introduction of the Energy Efficiency Directive; the plan to auction 300 million EU Allowances before 2013; and residual doubt in the integrity and security of contracts in the marketplace. This is compounded further by a visibly precarious and worrying macro-economic framework.

Last week’s headline in the Economist read “Debt, default and the West’s new politics of paralysis” and this week’s read “Time for a double dip?”; the United States even lost its AAA credit rating from S&P (though the administration say that S&P have their figures wrong). In Europe, we have Greece, Portugal and Ireland all threatening to default again and Spain and Italy for the first time. This has made the cost of borrowing much higher and will have a substantial effect on European Nations growth prospects – which in turn will have a substantial effect on the demand for Emission Allowances (EUAs) and subsequently their price. The World Bank reports that the remaining demand for carbon allowances and credits to the end of 2012 is just 132 million tonnes a 41% reduction on last year, this in a context of Deutsche Bank’s estimate that the total residual abatement requirement over the 11 years from 2010-2020 will be 378 million tonnes. Undeniably, this all makes for gloomy reading.

There might have been a silver lining to these economic recession storm clouds if the European Union could have unanimously agreed the Low Carbon Roadmap; as the recession meant that the 20% reductions on 1990 levels were now easily achievable. The market knew this and priced carbon contracts accordingly. The plan was to increase the target from 20 to 25 percent. On June 21st however, Poland vetoed this raise and the Low Carbon Roadmap. This flew in the face of the majority of member States who supported the increase in the 2020 target – as they knew this would help bolster the carbon price. Further it was contrary to a large contingent of business wishes.

Environmental Finance reported that “companies with a combined turnover of more than Euro 1 trillion greater than the collective GDP of Poland, Sweden and Austria… (Seventy-two firms) are calling for the EU to reduce emissions to 30% below 1990 levels by 2020, up from the current target of 20%.” The veto prompted traders to sell their positions, temporarily bolstering volumes but pushing prices down. No one underestimates the scale or toughness of the task facing the EU – but, it is unlikely that any politician will be able to suggest an increase in 2020 targets for the foreseeable future, particularly in the absence of progressed activity from either the U.S. or China.

The Energy Efficiency Directive, a proposal from the European Union’s DG Transport and Energy, is a source of worry but also a small glimmer of hope for maintaining the carbon price. It’s a source of worry as it would appear to overlap, if not undermine the ETS. While the directive’s proposal to improve energy efficiency 20 percent across the EU by 2020 is laudable; the proposal sends lassos out to industry sectors that are already covered by the ETS. Power, refineries, building materials, metals and pulp and paper would all be affected. Overlapping policy measures reduce demand for EUAs and consequently a reduction in the price of carbon. Barclays have estimated that the Energy Efficiency Directive, if approved, would reduce the requirement of EUAs by as much as 500 million tonnes by 2020. But this is where the small glimmer of hope enters… The commission has also proposed holding back the supply of EU allowances from phase III of the ETS (2013-2020). This “set-aside” if executed and substantial enough might be a means of supporting a meaningful carbon price through Phase III. Then again, who’s to say whether the Directive will see the light of day.. The same system that prevented the Low Carbon Roadmap from being enacted could also prevent the Energy Efficiency Directive being so, at least in its current form, as it must go through a ‘co-de-
cision process’ before it can be implemented. As in June, it will require unanimous agreement by the council of ministers that represent each of the member states, and so it is likely that many amendments will be made before, or if, it gets pushed through.

The greater worry here for participants of the Emissions Trading System, that is, utilities, industrials, banks, brokers and exchanges (the members of IETA) is that politicians are showing signs of changing their minds as to what the best way is to meet their Climate Targets. This apparent, albeit in the future, inconsistency destabilises and reduces confidence in all plans that players within the carbon market may have for Phase III. The equity markets it would appear have priced this in already to European utilities. Peter Atherton, head of European utilities analysis at Citi in London, has noted that the utilities sector has underperformed the wider market by about 30%. His fear is that governments will reneg on the promises they made in the past, that they might renegotiate subsidies paid to low-carbon energy sources, or impose windfall taxes on companies that are finally recouping a return on their investments but of course will be hitting voters’ wallets at the same time. Other commentators, many again members of this association, are worried that the ETS will be usurped or swamped by overlapping additional directives, regulations or carbon taxes. It is clear that a unanimous and clear statement needs to be made by the European Union that shows the hierarchy of each mechanism but carves out clear space for each so that they don’t compete against or undermine each other. Obviously, Bluenext, adamantly believes in the primacy of the cap-and-trade market (the ETS) to deliver the EU’s climate change goals.

Analysts have looked at the prospect of the auction of 300 million allowances by the EIB before 2013 as yet another force, through over-supply, that will bear down on the price of carbon. This pressure for action has lead to the call for a Carbon Central Bank that would be able to regulate the supply of carbon into the marketplace and therefore bolster prices. If this were to be adopted then this would have a significant effect as to how Trading in Phase III will be conducted. Christian de Perthuis, a professor at Paris-Dauphine University, has supplied a number of arguments to support the adoption of a Central Carbon Bank. He believes that such an institution could ensure that the important decisions surrounding banking, borrowing and offsets would be done with real insight as a result; harmonized regulation from 2013 would give a central carbon bank the means to adjust the supply of carbon currency to market conditions; delegating all the market intervention prerogatives to a central bank would avoid member states intervening at national levels thereby undermining collective efficiency; and finally he sees it helping the EU-ETS provide the right carbon price discovery to reach its long and short term goals. The debate continues...

On May 3rd this year we opened our “Safe Zone” of verified units to complete our Safe Harbour Initiative (SHI). As of the time of writing we remain the only spot market to reopen that provides a clear and substantiated price signal. We saw this as a necessary measure and the only way to restore the integrity and security of contracts in the marketplace. A small minority have complained that the verification process is overly burdensome, but the major players have all got behind the initiative. Our volume expectations have been humble, but the daily figures are now reasonable and consistent with what you would expect of the spot market at this time. Things will never be the same as a result of the phishing and theft events that marked the beginning of this year. But the market required a massive ‘flu-shot’ and it would seem that fear of similar attacks in the future, or fear for the value of allowances as a result in the present, have subsided now. As for our Safe Harbour, we will continue to be very pragmatic over the need for its existence and be wholly guided by our members’ and the market’s demand for such a structure. We have welcomed most of the changes that the European Commission and IETA have proposed, in particular the single Registry for the Phase III period, and will closely monitor how the implementation of these changes will be received by our members. God forbid any more attacks will befall the market as it can’t afford any further disruption.

While the spot market gives a picture of present market conditions – the derivatives’ market gives an expectation of what will happen in the future. The future however does not currently look good for the CER market post 2015. ICE have contracts listed for CERs from 2016-2020 but there is zero liquidity for these contracts. In part, this maybe a result of an EU desire to reduce the use of CER contracts as compliance instruments. On May 13th of this year, Bluenext launched its new “Green CER”, in response to market demand to see the price difference of CERs surrender-able for Phase II versus those suitable for Phase III (HFC-23 and Nitrous Oxide Adipic Acis destruction projects will no longer be part of the pool that qualify for compliance use). But the main reason for the lack of liquidity on CER derivatives contracts post 2015 is that the market does not currently see the UN, in concert with the EU, resolving the issues surrounding the Kyoto Treaty within the foreseeable future. While NAMAS (Nationally Appropriate Mitigation Actions) offer a way to by-pass the need for bilateral agreement it will take some time before these will come to maturity where they can give comfort. For hope to be placed in the CER situation post 2015, the world will have to have come out of recession and the nation states of the UN reach accord on the fate of the Kyoto process. This is important as project developers, who typically have a 7 year cycle of planning, building and recouping on their low-carbon projects, need a clear price signal to plan their business case and then attract investors. The absence of a clear price signal creates a
vicious cycle that will make conditions to raise funds for future projects much harder.

**So, Returning to Woody, How Do We Turn God’s Belly-Laugh to a Smile?**

If the overall objective is to reduce GHG emissions and it is true that we must have a clear price signal to attract investment into low carbon technologies – what must happen in Phase III? There’s an African proverb that says “tomorrow belongs to the people who prepare for it today” and there are obviously elements here that are more outside of our control than within. But what can the members of IETA and the readers of this publication do here and now? The first is to ensure, or lobby for, a clear set of rules that work in harmony together and do not overlap or undermine a mechanism that has a proven history of achieving its target of reducing emissions. The second is to avoid measures, or put in place mechanisms that counter, the forces that place undue downward pressure on the price of carbon, with a particular focus on the forces related to supply. Of course, for us to achieve the primary goal of being successful in reducing emissions we will need a range of complementary measures, but let’s then make sure they don’t work against each other and safeguard the maintenance of a single carbon price signal over such a quiver-full of regulations. With this consistency and clarity we might then be able to remove fear of the future of conditions within Phase III of the ETS. If we can steward ourselves successfully through these measures and then pray for concord at the UN on Kyoto and a revitalised global economy - and then those prayers are answered – well, then we can look to the prospect of Phase III with albeit not a smile on our face, but at least not a frown.

*Keirón Allen*

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The shape of international climate change policy post 2012 continues to be deliberated. After the climate-change talks at COP16 in Cancun and then in Bangkok this year, optimism is fading for an internationally agreed solution at COP17 in Durban in November.

As a result, we are seeing climate policy diversifying into a multi-track framework, with nations and regions developing bespoke regulated, internal or bi-lateral approaches and an increased development of global voluntary schemes.

For these mechanisms to demonstrate that they are effective, assuring investors and other stakeholders, robust monitoring, reporting and verification (MRV) is required. This fact is supported by the work of the Consumers International and Accountability who conducted research in 2007 on ‘What Assures Consumers on Climate Change’ which revealed that 70% of consumers want climate-change claims by businesses to be proven by independent third parties.

However, for a robust MRV system to be implemented that builds mutual recognition across schemes, national governments and voluntary bodies must take heed of the experience and lessons learned in this area to-date.

One region that has led the way in the subject of MRV is Europe, with the EU Emissions Trading Scheme (ETS). The EU ETS has a vital role to play in the international carbon market, which is expected to be worth more than €1 trillion by 2020. As the first and largest of the world’s international emissions trading schemes, with an estimated €72 billion in transactions last year, it has set the standard and pace for the global carbon trade and highlights what emissions trading can achieve.

Effective mechanisms for emissions trading must reflect a number of key policy principles and standards. From an MRV perspective, to guarantee the creation of a fully interchangeable commodity within and across trading schemes, the standards for the MRV of emissions must be consistently applied to all sectors and territories. These key principles relate to ensuring the completeness, consistency, transparency, accuracy, cost-effectiveness and faithfulness of the emissions being reported and traded, together with the levels of assurance and materiality applied through the verification process.

The EU ETS has long recognised the need for sensible standards and guidelines to ensure a consistent approach to compliance and verification. What sets it apart from other schemes is its experience, coupled with an ability to embrace change. It has constantly progressed to suit a very dynamic marketplace.

The EU scheme was designed with a ‘phased’ approach to adopt what becomes known through experience; the phases become progressively longer as lessons are learned from the initial shorter phases. The first Monitoring and Reporting Decision (commonly known as the Monitoring and Reporting Guidelines, or MRG) of January 2004 operated throughout Phase I. On completion of the first phase, a review was undertaken of possible improvements to the MRG and, in 2007, the EU launched its second MRG Decision. This formed the basis of MRV requirements for Phase II, running through to 2013.

Of the many improvements made, the most notable were those to consistency, simplification and acceptance of common practices. Examples of these include: the recognition of what are commonly ‘commercially traded fuels’ and the acceptance of invoiced quantities for these fuels, for monitoring purposes; the recognition of a need for defined ‘standard conditions’ of the temperature and pressure conditions for monitoring; the introduction of a ‘fall-back approach’ for the monitoring of source streams where it is not technically feasible to achieve the minimum tiers of uncertainty; and the recognition of the importance of links to environmental-management systems to ensure the quality control of the data acquisition, handling and control activities.

Attention is now being paid to Phase III, which starts in 2013. During the previous phases, it was recognised that Member States were applying the MRG differently, employing different definitions, inspection methodologies and penalties. To promote further harmonisation, Phase III requirements for MRV no longer will be addressed through a Commission Decision, opting instead for separate EU regulations on Monitoring and Reporting (M&R) and Verification and Accreditation (V&A), which are required to be formally adopted by the end of this year. As EU regulations, these will not require the implementation of legislation from member states, thereby removing the potential for different translations, interpretations and applications, supporting a more consistent approach. Previous
MRG requirements have been rearranged to provide a clear storyline and structure and to reduce repetition.

With regard to other differences, the many changes specified in the new regulations vary, but some of the key changes include: Monitoring plans now form the basis for the regulations on M&R (the text of which has been amended to improve clarity, with formulae and tables placed in annexes); there are new definitions for biomass, biofuels and bioliquids and links to the sustainability criteria of the Renewable Energy Directive 2009/28/EC; and there are improvements to the requirements for the density of aviation fuel – a subject which has been a major sticking point for the aviation industry.

The V&A regulations are still based on the principles contained in Annex V of the EU ETS Directive, and now combine elements of the MRG with the requirements of the European Cooperation for Accreditation document EA6/03, the EA Document for the Recognition of Verifiers under the EU ETS Directive and ISO 14065. The aim is to provide further clarification and a more consistent approach from V&A bodies. This regulation now includes detailed requirements for National Accreditation Bodies and cooperation between accreditation bodies to safeguard the overall quality, consistency and efficiency of verification throughout Europe.

The overall expectation is that the new regulations will help the EU to achieve more consistent standards in MRV across all member states, providing greater assurance to stakeholders that the emissions have been monitored and reported to high standards. In this way, the EU ETS can now create an even more robust framework that can continue to serve as a model for other schemes, while working towards a common global carbon market.

There are signs that other schemes and standards have drawn from the experiences of EU ETS. Key principles and terminology have been taken from the EU ETS MRG and reflected in the internationally accepted standards for GHG monitoring, reporting, validation and verification of the ISO 14064 series.

Similarly, the United Nations Framework Convention on Climate Change (UNFCCC) and its stakeholders are beginning to recognise that the standard auditing techniques and principles for MRV applied to project-level emission reductions under the Clean Development Mechanism (CDM) fall short of the best practices implemented by the EU. The CDM has yet to incorporate the principles and practices of consistency, level of assurance or materiality. But workshops held by the UNFCCC secretariat this summer with key stakeholder groups - including the Designated Operational Entities (DOEs), the project developers and Non-Governmental Organisations (NGOs) - discussed draft documents of the Validation and Verification Standard and the ‘Project Standard,’ amongst others, that propose to include enhanced general principles and levels of assurance.

Furthermore, the Subsidiary Body of the Convention for Scientific and Technological Advice is currently gathering stakeholder views on materiality and its inclusion in the CDM in preparation for making a recommendation to the Parties at COP17.

Another illustration of the successful development of the MRV requirements within the EU ETS is how the scheme continues to expand to include more sectors, processes and gases, and to harness technological solutions to the MRV requirements:

- As the scheme has progressed, additional production processes such as nitric acid and adipic acid, which is used in the production of nylon, have been included together along with their emissions of N₂O,
- The incorporation of the aviation sector into the EU ETS in 2010 has been well documented and Lloyd’s Register Quality Assurance was part of the consortium working with the European Commission to comment on the verifiability of the MRV guidelines for EU ETS Aviation,
- The completion of Module 1 of the ETS Workflow Automation Project announced by CDC Climat and SFE in July specifically addressed the aviation sector’s emissions reporting as required by the EU ETS. This module allowed information on the sector’s 2010 tonne-kilometre and emissions data to be collected through an on-line interface,
- Phase III will see the introduction of Carbon Capture and Storage (CCS) into the scheme; and
- The European Commission continues to state that, in the absence of equivalent measures from the sector, the potential for the inclusion of marine transport within the EU scheme remains very real.

MRV is indispensable for the integrity of emissions-trading schemes and the global carbon market because it builds stakeholder confidence. The success of the carbon market, like any other, relies on confidence in the currency. It requires confidence that ‘a tonne is a tonne’, confidence that units will continue to have the expected value; and confidence that different parties will accept that value.

MRV provides transparency for the users of emissions reports or for the claims on which those users can base their decisions. It provides confidence that the relevant emission sources have been included and that the correct measurements have been used. It also assures the accuracy of the figures, support-
ing meaningful comparisons between operators and reporting periods.

Emissions-trading schemes are helping to achieve reductions in emissions of anthropogenic greenhouse gases. The EU ETS has demonstrated this through reductions in the greenhouse gas emissions of the EU27, and these reductions are destined to increase after Phase III measures are adopted.

But without an international agreement, this emerging multitrack framework requires consistent MRV to ensure harmonisation and fungibility of credits and a truly global carbon market. For this to happen, all schemes must build a much greater level of consistency into their systems. The EU ETS is the dominant model upon which other regions and nations should base their own developments.

With regards to the EU ETS itself, the draft regulations on M&R and V&A will help to further improve consistency within the member states by eliminating different interpretations. Independent schemes would do well to follow the example of the EU ETS, since they are bound to experience the same problems that affected the EU ETS in its formative years. If they can resolve these problems and adopt the best practices from the EU ETS, then linking regional and national schemes will be possible and the world will be a few steps closer to an effective global carbon market.

LRQA

is a member of the Lloyd’s Register Group. We are a leading independent provider of Business Assurance services including certification, validation, verification and training across a broad spectrum of standards and schemes. We are recognised by over 45 accreditation bodies and deliver our services to clients in more than 120 countries. LRQA Business Assurance helps organisations manage their climate change challenges, systems and risks to improve and protect their current and future environmental performance and meet their stakeholders’ needs.

In the climate change and sustainability arena, our services include the Clean Development Mechanism (CDM), Joint Implementation (JI), the EU Emissions Trading Scheme (EU ETS), ISO 14064, PAS 2050, CSR report verification, EN 16001 and ISO 14001 as well as a range of regional and national standards and schemes.
ICAO and its Member States have been actively working to develop global solutions for the sustainable development of international aviation. This is being accomplished through the setting of global aspirational goals for the sector, as well as by developing and facilitating the global implementation of mitigation activities, including technical, operational and market-based measures.

As Tetsuya Tanaka reports, the critical legal issues associated with new emissions mitigation-related financing and levy instruments now under consideration, and the practical challenges arising from the global nature of international aviation emissions, require further consideration. ICAO has provided vision and leadership in this regard through the guiding principles set out in the Annex to Resolution A37-19 as agreed at the 37th Assembly in late 2010, stressing that any air transport-related market-based measures must be applied fairly with respect to other transport sectors and any revenues generated used primarily to address aviation-specific emissions.

The climate change Resolution adopted by the 37th Session of the ICAO Assembly in October 2010 reflects the willingness of ICAO’s Member States to take concrete steps to develop global solutions to limit or reduce CO2 emissions from international aviation, thus contributing to the global efforts addressing climate change.

While ICAO presented its developments as an input for the global climate change agreement being negotiated under the United Nations Framework Convention on Climate Change (UNFCCC) process, no specific decision on this subject has been taken under this process given some divergent views that have been expressed by Parties—mainly due to the international aviation sector’s mobile and global nature. A similar dynamic was also evident at the recent UNFCCC Conference in Cancun, Mexico, in December 2010 (COP/16).

On a larger scale, the UN Climate Conference in Cancun agreed to limit the global temperature increase to 2°C or lower. This stabilization pathway will require substantial international efforts and significant financing. In this regard one of the milestones reached at Cancun is related to long-term financing—the establishment of a special Green Climate Fund (GCF) designed by a Transitional Committee (TC) which will take into account the report of the High-level Advisory Group on Climate Change Financing (AGF) released in November 2010.

**Figure 1: Report of the UN-SG’s High-level Advisory Group on Climate Change Financing (AGF)—November 2010**

*AGF concluded* it is “challenging but feasible” to meet the goal of mobilizing $100 billion per year by 2020 for actions for developing countries, and that “funds will need to come from a wide variety of sources”, including:

- **International Aviation** - $2-3 billion per year
  - 800 MT-CO2 estimated from global aviation in 2020.
  - 500 MT-CO2 excluded for domestic/developing countries’ flights.
  - 250 MT-CO2 taxed with assumed carbon price of $25/t-CO2 ($6 billion).
  - 25-to-50 percent of the $6 billion earmarked for climate finance ($2-3 billion).

- **International Shipping** - $4-9 billion per year
- **International Transport** - $10 billion per year

*AGF recommended* that further work on instruments should be undertaken by ICAO and the IMO.
Climate Financing under the UNFCCC and AGF Report

UNFCCC COP/16 recognized that developed countries are committed to a goal of jointly mobilizing $100 billion per year by 2020 to address the needs of developing countries. It further agreed that funds provided to developing countries may come from a wide variety of sources, public and private, bilateral and multilateral, including “alternative sources.”

While COP/16 did not specify the sources of revenue for the long-term climate financing, it took note of the AGF report which will be considered by the TC with respect to the design of the GCF. The outcome of the TC will be reported to the next UNFCCC Conference in Durban, South Africa, from 28 November to 9 December 2011 (COP/17).

The AGF was established by UN Secretary General Ban Ki-moon in February 2009. It was co-chaired by the Prime Ministers of Norway and Ethiopia and its membership included senior ministers and officials from central banks and other experts on finance and development. The Group conducted a study on the identification of practical proposals relating to the significant scaling up of long-term public and private financing for climate change mitigation and adaptation strategies in developing countries, and how best to deliver it, in the spirit of the political commitments contained in the COP/15 Copenhagen Accord.

The AGF report, issued in November 2010 just prior to COP/16 in Cancun, suggested that international aviation could be a potential source of revenue through a fuel levy, passenger ticket tax or emissions trading system, contributing up to $3 billion per year to long-term climate financing (see Figure 1, previous page) The full text of AGF report is available at: www.un.org/wcm/content/site/climatechange/pages/financeadvisorygroup

The AGF report may possibly have political, legal and other practical implications for ICAO’s existing policies and practices, including Resolution A37-19 adopted by the 37th ICAO Assembly.

Risk of Undermining ICAO’s Mitigation Efforts

ICAO and its Member States have been actively working to develop global solutions for the sustainable development of international aviation. This is being accomplished through the setting of global aspirational goals for the sector, as well as by developing and facilitating the global implementation of mitigation activities, including technical, operational and market-based measures. Resources to facilitate the implementation of these measures in all ICAO States and Regions, in close cooperation with the aviation industry, are critical to the achievement of the global aspirational goals.

For example, the world’s airlines will need to purchase approximately 12,000 new aircraft at an estimated cost of $1.3 trillion by 2020. Sustainable alternative fuels for aviation offer one of the most exciting and promising opportunities for reducing aviation’s GHG emissions and ICAO is now facilitating the regulatory and financial frameworks to ensure that such fuels are available in a timely manner and in sufficient quantities for use in aviation.

If the international aviation sector is singled out as the sole source of revenue, this is likely to result in a shortage of resources to facilitate mitigation activities by the international aviation sector itself, and in a disproportionate contribution of resources as compared to other economic sectors. Of note in this regard is that CO2 emissions from aviation (domestic and international operations) currently account for approximately two percent of total global CO2 emissions. More than half of aviation’s two percent contribution derives specifically from international aircraft movements (roughly 1.2 percent).

The 37th Assembly agreed on the guiding principles for the design and implementation of MBMs for international aviation in the Annex to Resolution A37-19. One of these principles stresses that “market-based measures should ensure the fair treatment of the international aviation sector in relation to other sectors.” The Assembly also “strongly recommended that, where revenues are generated from market-based measures, they should be applied in the first instance to mitigating the environmental impact of aircraft engine emissions.”

Legal Ramifications of Emissions-related Levies

The proposed “fuel levy” and “passenger ticket tax” for international aviation in the AGF report do not address a critical challenge associated with the legal status of emissions-related levies for international aviation.

Generally, levies refer to charges and taxes. Article 15 of the Chicago Convention contains provisions regarding charges imposed by States for the use of airports and air navigation facilities, and its related ICAO policies (Doc 9082, ICAO’s Policies on Charges for Airports and Air Navigation Services) make a conceptual distinction between a “charge” and a “tax,” in that a charge is a levy that is designed and applied specif-
ically to recover the costs of providing facilities and services for civil aviation, and a tax is a levy that is designed to raise national or local government revenues which are generally not applied to civil aviation in their entirety or on a cost-specific basis.

Article 24 of the Chicago Convention addresses the exemption of taxes on fuels, lubricants and other technical supplies onboard aircraft, and the related ICAO policies (Doc 8632, ICAO’s Policies on Taxation in the Field of International Air Transport) recommend the reciprocal exemption from all taxes levied on fuel purchased for international flights. ICAO’s policies also call on States to reduce or eliminate taxes related to the sale or use of international air transport.

In practical terms, the reciprocal exemption of taxes on fuel for international aviation has already been implemented in approximately 95 percent of the 4,000 existing bilateral air services agreements between States.

On 9 December, 1996, the ICAO Council adopted a policy statement in the form of a Resolution, wherein the Council strongly recommended that “any emission-related levies be in the form of charges rather than taxes, and that the funds collected should be applied in the first instance to mitigating the environmental impact of aircraft engine emissions,” which is also in line with the recommendation of the 37th Assembly on the application of revenues.

Practical Challenges for Differentiation
It seems that the AGF report does not fully address the challenges associated with the possible differentiated application of MBMs for international aviation.

It should be recognized that several key characteristics of international aviation led to its inclusion in Article 2.2 of the Kyoto Protocol. While emissions from domestic aviation can be considered using the same approach applied to emissions from other sectors occurring within a State, emissions from international aviation differ as they are not contained within a single State and may occur within the territory of other States or in areas outside of recognized national boundaries, such as over the high seas.

There has been a long unresolved debate under the UNFCCC process over the allocation of international transport emissions to individual States and no agreement on the way to proceed has yet been reached. The differentiated application of market-based measures for international aviation, as in the AGF report, would have clear implications on this debate.

Toward a Fair and Effective MBM Framework
Resolution A37-19 makes international aviation the first sector with global aspirational goals of improving two percent annual fuel efficiency and stabilizing CO2 emissions at 2020 levels. The Assembly also agreed on the development of a framework for MBMs, including further elaboration of the guiding principles, and decided to explore a global scheme for international aviation.

In addition, the agreement on the voluntary submission of States’ national action plans to ICAO will allow States to identify a suitable basket of measures to reduce GHG emissions from international aviation as well as any assistance needs to implement such measures (see Secretariat Article in previous ICAO Journal, Vol. 66, No.2, p.30). Moreover, it was agreed that the Organization will study, identify and develop processes and mechanisms to facilitate the provision of technical and financial assistance, as well as facilitate access to existing and new financial resources, technology transfer and capacity building, to developing countries.

The lack of a decision under the UNFCCC process on how to address emissions from international aviation allows ICAO to move forward by making further progress on the actions requested by the Assembly. The design and implementation of MBMs for international aviation should be treated as one element of ICAO’s comprehensive mitigation strategy to achieve aviation’s global aspirational goals.

ICAO also needs to closely follow-up and cooperate with further work on the long-term climate financing under the UNFCCC process by keeping informed of ICAO’s achievements and continuous efforts to limit or reduce CO2 emissions from international aviation. The critical legal issues associated with emissions-related levies and the practical challenges arising from the global nature of international aviation emissions also need to be recognized. ICAO’s work and leadership on an effective MBM framework for international aviation will be paramount in this regard.

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What is happening around UNFCCC’s negotiation?

A True Compass Always Trumps a Crystal Ball in the Open Ocean
Gilberto Arias, Ambassador to the United Kingdom, Republic of Panama

Since the 2007 COP 13 meeting in Bali, the UNFCCC’s climate change negotiations have been in a state of brinkmanship rivalling this Summer’s debt ceiling negotiations by lawmakers in Washington D.C.; both problems are equally complex, equally intractable—and equally absurd for those inexperienced with their processes—yet equally momentous in terms of prosperity for practically all peoples on the planet.

After Bali and all that transpired through COP 15 in Copenhagen, and the near miraculous agreements reached in Cancun last December, the world is moving consciously to a collective response to anthropogenic climate change. How collectively? How far? Is it enough? Can we live with only a 50% chance of reaching a 2°C temperature rise? Can we adapt and continue if we overshoot this target? These are questions which are still on the table—and will remain there for years, pending the obligatory “what-if-we-had-done” and “finger-pointing” exchanges to begin after the 2015 IPCC review.

The international shipping sector, since 1948, governs itself through the International Maritime Organization (IMO), a UN delegated body based in London; this body has never considered itself exempt from action on climate change and global warming; but it is important to bear in mind the enormous responsibility in tinkering with the international maritime transport system: it’s 900 million tons of annual CO2 emissions amounts to 2.7% of world-wide GHG emissions, associated with over 80% of world trade and one billion tonne-miles of cargo transport per day—what trade-offs or costs are we willing to risk with the repercussions affecting the greatest link in the chain of development?

It will remain an incredibly delicate business to introduce regulations and possible distortions to a system which so fundamentally affects absolutely every level of commerce in the world, given that only very slow true feedback can come back to the regulators, because of the very diverse conditions in which the industry operates, and the time required to process and analyse information on the operation of whatever system is put in place.

Deliberations on the subject of reductions in maritime GHG emissions have been on IMO’s Marine Environmental Protection Committee’s (MEPC) agenda for several years. The Conference of the Parties to MARPOL 73/78, which adopted Annex VI of that Convention in September 1997, highlighted the need for cooperation in the exchange of information on greenhouse gases, requested the first study of carbon dioxide (CO2) emissions from ships, which was completed in 2000, and invited MEPC to consider strategies to reduce CO2 emissions. Subsequently, the IMO Assembly adopted resolution A.963(23) in December 2003, in which it urged MEPC to identify and develop mechanisms to achieve the limitation or reduction of greenhouse gas emissions from ships, including evaluation of technical, operational and market-based solutions. MEPC recently adopted mandatory global design-efficiency standards for newbuilds and efficient management guidelines for existing vessels, and is currently analysing 10 proposed Market-Based Measures.

Over the years, IMO has sought to move in step with other multilateral bodies, however, IMO seems to be able to move faster than UNFCCC in respect to action on global warming, which compiles discussion as IMO Member States and Parties to the UNFCCC by and large wish for action to be coordinated between the two bodies, yet the deadlock in the UNFCCC’s “International Sectors” discussion has prompted IMO to pursue at least some preliminary initiatives.

Moreover, the concept of common-but-differentiated-responsibilities, intrinsic to the UNFCCC, while not denied at IMO in it’s regulatory discussion of GHGs, is impractical to apply directly at IMO because of the carbon leakage problem and the inherent system of IMO of no-more-favourable-treatment of vessels, fundamental in the establishment of common safety practices for all ships at sea.

This past July, after years in discussion, IMO adopted it’s first global measures aimed at reducing emissions in the international maritime transport sector. Hailed by IMO’s Secretary-General as a groundbreaking first step, it has remained a difficult measure which may still allow room for regional arrangements to emerge. This could lead to a Balkanization of emissions regulations world-wide, which would not be in the interest of open, global commerce.

The adopted measures, chiefly known as Energy Efficiency Design Index (EEDI) regulations, are mandatory for certain classes of new ships over 400 gross tons notionally ordered after 1 January 2013—though there are provisions which allow a delay of up to six years in implementation of the stepped reduction requirements—and mandate a design characteristic, borne out in a survey, which aim to reduce that class vessel’s energy requirements from a given baseline. In a parallel
What is happening around UNFCCC’s negotiation?

International Maritime Transport in Context (2007 2nd IMO GHG study MEPC 58/INF.6)

- International Shipping: 2.70%
- Domestic Shipping: 0.60%
- International Aviation: 1.90%
- Rail: 0.50%
- Road: 21.30%
- Others: 73.00%

Absolute amounts of emissions: 847 million tonnes
Actual carriage: one billion tonne-miles per day

The second tier of proposals introduces tradable resources, but only within the maritime sector. The aim of these proposals is to broadly present a financial leverage mechanism which would highlight incentives to move away from inefficient systems and ship management towards more efficient practices—the aim in this tier can be understood as accelerating the adoption of technical and operational measures and to reward shipowners which modify their ships towards improved efficiency technologies. The proponents to this tier suggest that these mechanisms include enhanced measures which will allow better control of emissions while still skirt- ing the UNFCCC’s common-but-differentiated-responsibilities philosophy.

The third tier of proposals promotes the generation of funds for operations outside of the shipping sector; there are two types of proposals under study. The first is the use of a pricing signal to the operator through a levy on the ship’s fuel; the levy would promote efficient operation of the vessel and funds arising from the levy would be used to promote research and development, capacity-building and technical assistance, and adaptation and climate change financing. The second type of out-of-sector proposal promotes an emission trading scheme similar to the European ETS scheme presently in operation, or cap-and-trade schemes in other countries. This last proposal trades emissions through a carbon market, with variable pricing and some centralised control on the phases of adoption; like the levy proposal, revenues raised from this system would promote research and development, capacity-building and technical assistance to developing countries, and adaptation and climate change financing.

Given that this third tier does allow mitigation through actions outside the shipping sector, it is notionally possible to cap emissions in absolute terms for shipping through these mechanisms, provided there are enough mitigation credits available for the fleet’s requirements in serving world commerce. Of course, if we understand the industry to essentially act as a facilitator for global economic and social develop-

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1 See the report of IMO’s Expert Group on Feasibility Study and Impact Assessment of Possible Market-based Measures at MEPC 61/INF.2
Evidently each of these tiers presents new layers of complexity to the underlying MBMs—tier one being the simplest, and tier three being the most complex; and between them, there is ample room for cross-pollination; yet the discussion we noted earlier on the very delicate nature of tinkering with the economics of this invaluable link in all facets of world trade are important.

Unfortunately there are no easy answers to the debate on emissions reductions in the international maritime sector, and implementation of an instrument will be difficult.

Even in the simpler tier one MBM, while there are great potential emission savings through combinations of technical measures, an important mechanism involves slowing the vessel: studies\(^2\) have shown that a 10% reduction in speed equates to a 27% reduction in fuel consumption and associated emissions, however, the ship will take 11% longer in it’s transit leg—yielding a still attractive 19% reduction in fuel consumption. However, this calculus does not account for the inventory cost of the cargo being loaded for 11% longer time, nor delays in shipping as the return leg for the vessel will also require an 11% longer transit, which may in turn imply that more ships would be needed for a given route, or that frequency of sailings for a given cargo type may be affected, which in turn may affect the importer or the exporter, or both.

The more complex tiers of MBMs also come against the difficulty of reconciling the UNFCCC’s common-but-differentiated-responsibilities philosophy with IMO’s requirement of no-more-favourable-treatment. It is impossible to differentiate among ships, which may change flags at any time, in the same way as UNFCCC differentiates between Annex I (developed countries) and non-Annex I (developing countries) actors.

Several ideas have been put forward on how to deal with this issue, such as factoring in a “net incidence” proxy for developing states and structuring some sort of rebate to account for the blanket burden which must be borne by all for the system to work, but concerns have been raised on the time lag between the payment out and the return, and the mechanism for that rebate to actually reach the appropriate parties effectively.

The interrelated nature of transport in modern trade also makes the incidence of these costs very difficult to nail down precisely, as rarely do manufactured goods move from a single raw material source to a single manufacturing station to a single market, so it is possible for the sub-assembled components to a final product to pass through many stages of transport—where incremental levies may add into the internal costs of the product independently of the final leg of transit, and this may not be caught or offset as clearly as some proponents of the rebate key would hope—especially as it is to be applied in a differentiated fashion between different countries. Nevertheless, it seems to be a concept aimed squarely at reconciling the UNFCCC’s common-but-differentiated-responsibilities philosophy with IMO’s requirement of no-more-favourable-treatment.

In the end, it is clear that the concept of a rebate adjustment will need to be a politically agreed option, and not necessarily one defined by strict economic analysis, as a “full and complete” accounting of the ramifications and incidences in all levels of commerce of a charge on international shipping is a Sisyphean task and would threaten to paralyse any correction to the system once it is in place.

Therefore, the one recommendation that we can definitely proffer is that action should be cautious, as by and large the inclusion of new regulations may develop new distortions in efficient patterns of international trade, and while it is clear that once in place, the aim of the system will be to raise further revenues over time, it is important to understand the consequences to trade from an original, modest position.

The third tier also presents challenges that are fundamental to many countries, as these ambitious schemes can be seen to articulate the collection of a global tax, which raises constitutional issues in many countries. Also, a global scheme in which many actors contribute is not something that IMO has implemented before, so details regarding reporting, verification and audit (particularly as we are dealing with a complex mix of sovereign actors, port operators, suppliers, and ship operators in plural jurisdictions), compliance, proper forum for fraud investigations, currency restrictions and the harmonisation of an international scheme for emissions, carbon leakage and traffic through non-party actors, among other things, will imply that discussions on the MBMs will take some years to refine.

In this last point, a narrower scheme may be easier to implement as there will be fewer actors to harmonise—for example, instead of applying an MBM to the entire MARPOL fleet at once, the scheme could be initially limited say to vessels over a certain size (which usually employ more sophisticated management), thereby reducing the administration of the system through a participation of fewer vessels without a material degradation of the carbon emissions. This, of course, may jeopardize the environmental integrity of the scheme unless the “package” included something for all ships, but with a staged implementation.

\(^2\)See the Institute for Marine Engineering, Science and Technology’s submission MEPC 62/INF.7
What is happening around UNFCCC’s negotiation?

It is important to bear in mind the great differences in the industry’s actors, ranging from single-shipowning spot market operators, often prevalent (though not exclusively) in developing countries, to corporate liner-fleet owners. It may well be that a solution which is practical for one group may not be approachable for the other. Can IMO introduce a hybrid, goal-based approach, where operators can act either through markets or technical measures for their emission reductions? If we allow this goal-based choice, which would foster better innovation in real reductions, how would this affect the supply and demand for tradable emissions or carbon credits as the scheme moves forward?

There are also a number of legal considerations relating to the management of ships under charter that need to be considered, so as to not penalise the actors of a shipping venture for using the most environmentally efficient practices. Moreover, although the more ambitious proposals imply reductions through the use of markets, it does seem sensible to insist that some reductions happen within the sector as well, so as to instil a requirement for research and investigation in port and ship management design and practice, and to promote higher environmental efficiency in the oceans; if we merely move to 100% out-of-sector offsets for shipping emissions, we will lose the opportunity to accelerate the tremendous advances in ship design and practice gained over the last few years.

If we move into crystal-ball territory, it seems probable that there will be hybridization—call it cherry-picking, mix-and-match, condensation—among the proposals under discussion, so as to construct fewer, “improved” proposals, and there is at least one suggestion to adopt say the tier one proposal alongside any other tier of proposals. Having a goal-based mix of approaches would simplify the initial compliance for many ships, and allow flexibility for the maintaining of the efficiency of the sector.

It seems also clear that an MBM scheme will require a roll-in period for information gathering and then a staged implementation, in order to understand and manage distortions and effects; it will be important to protect current, efficient trade patterns while mitigating emissions—recall the responsibility of not distorting services to 90% of world trade through these measures. In this logic, it will make sense for larger ships to enter implementation first, which covers more emissions through fewer actors, though the scheme will have to include a wider scope so as to not affect overall environmental integrity.

Furthermore, a circumspect view today would suggest that the future system will probably require an interpreted form of common-but-differentiated-responsibilities, including some form of rebates, but these in turn may introduce new distortions in world, regional and sub-regional trade, so these will need to be introduced with caution, discussion and understanding.

Recalling that under existing international regulations for shipping, IMO does not have a scheme in place which refers to a charge on individual ships for the benefit of third parties, so the mechanics of audit, interrelation of flag state and port state accounting, and the proper legal forum for recourse of these charges are complex questions that must be dealt with in detail, especially given the fact that ships may change owners and flags at any time.

Given the challenges in navigating in such uncharted waters, it is also understandable that the new instrument will take a number of years to distil and write up, longer if there is marked opposition or if it is not perceived to move in coordination with other global initiatives; bearing in mind that normal adoption of new instruments is seven years, although some instruments have been adopted faster.

Finally, care must also be exercised with respect to the environmental integrity of commercial transport systems generally, and not just within the international shipping sector, as it is important to bear in mind that shipping is the most energy-efficient means of transport; in this light, it would not make sense to introduce measures which may deviate or invite traffic patterns to move away from efficient sea routes.

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Credits Where Credits Are Due: Keeping Track of International Greenhouse Gas Units After 2012

Andrew Prag, OECD

Greenhouse gas (GHG) market mechanisms exist to facilitate achievement of environmental goals at least cost. To be effective, units from GHG market mechanisms must be environmentally credible and attractive to market participants. These factors depend not only on the rules governing the mechanisms, but also on the reliability of the accounting system that determines how units are traded and eventually used to meet environmental goals. Whilst the Clean Development Mechanism (CDM) has often been criticised for its regulatory approach, the Kyoto Protocol (KP) unit accounting system has largely been taken for granted by mechanism participants.

After 2012, the lack of a robust accounting system could become a key constraint for international trade in units from mechanisms operating outside of the KP. Even if the KP enters a second commitment period, it is unlikely that the GHG unit accounting system will continue unchanged after 2012. One reason for this is that several developing countries have proposed mitigation actions under the Cancun Agreements, some of which are economy-wide, so the future system needs to provide transparency on whether and how credit units generated in such countries are counted towards the mitigation actions or targets of each country involved in the trans-

Figure 1: A “Middle Ground” for International Unit Accounting

What is happening around UNFCCC’s negotiation?

action. Furthermore, after 2012 it is likely that new types of GHG units will be created and traded. Several countries are planning to implement domestic emissions trading schemes (ETSs) and new emission reduction crediting initiatives that might be organised outside the framework of the United Nations Framework Convention on Climate Change (UNFCCC). How such units may be accounted for, and how they may interact with existing and new market mechanisms developed and regulated by the UNFCCC, remains relatively unexplored. The stage appears set for an increase in the variety of GHG unit types and the relatively straightforward system of unit flows under Kyoto – with credit units generally originating in “uncapped” developing countries and subsequently being used in developed countries to meet national targets or ETS obligations – could become more complex.

**A “Middle Ground” Accounting Framework**

Recent OECD/IEA work explored scenarios for how GHG unit accounting might operate after 2012 and suggested that a “middle ground” option could combine elements of the KP rules with country-led mitigation pledges and mechanisms. This scenario can be defined by a number of building blocks (Figure 1), and could operate in parallel to a continuation of the KP with commitments for a small number of Parties.

GHG accounting rules – for example, how national GHG inventories and mitigation pledges are defined – are important to provide clarity on how units might be used to help meet pledges. This is a complex area of climate change negotiations and not the focus of this article. The other blocks describe more technical aspects of how an accounting framework could be developed that continues to allow effective international use of market mechanisms.

International Emissions Trading (IET), defined under the KP, means that the system effectively functions as a cap-and-trade scheme with a common allowance unit (Assigned Amount Units, AAUs). After 2012, it is unlikely that countries without KP commitments would agree a single common allowance unit, even if they recognise units defined by domestic or regional trading schemes. For units from market mechanisms to be used internationally, the international framework must nevertheless be able to accommodate the use of tradable units to meet national pledges (Figure 2).

KP targets are calculated according to agreed accounting rules and converted directly to a quantity of AAUs, meaning that targets are defined ex ante by a stock of tradable permits. If a country’s inventory emissions exceed its stock of units during the pledge period, the country buys eligible KP units to make up the shortfall. In a system based on national pledges, targets would no longer be converted to a quantity of allowance units, even if common accounting rules are used to define pledges. If inventory emissions in the target year are higher than the pledged level, countries may seek to use international units to effectively “readjust” their inventory emissions.

**Figure 2: Using GHG Units at the National Level Without a Common Allowance Unit System**

1. Allowance-based system (e.g. Kyoto Protocol): compliance demonstrated by submitting allowance units plus purchased units.

2. Pledge-based system: various types of purchased units used to readjust inventory emissions in target year.

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2 At the sixteenth Conference of the Parties to the UNFCCC (COP 16), Parties agreed to consider the establishment of one or more market-based mechanisms at COP 17 in 2011.

3 As well as AAUs, other units include Certified Emission Reductions (CERs) from the CDM, Emission Reduction Units (ERUs) from Joint Implementation projects.
to meet the target. Use of offsets at the national level would therefore become similar in principle to a company or individual choosing to purchase voluntary credits to offset part of its emissions inventory.

This ex-post accounting could provide a basis for continued use of units outside of the KP but would require strong tracking and visibility. Such a system may provide less market clarity than having targets converted to tangible tradable units ex ante, for example in the certainty of demand and future unit eligibility. A key question is therefore how mechanisms could be regulated and tracked under this system in a way that is attractive to the private sector and stimulates increased investment in mitigation.

Emissions Trading Schemes in a Pledge-based World

New emissions trading schemes are taking shape at the national and sub-national level in many countries. Most are unlikely to create units directly converted from AAUs in the way that EU ETS units currently are. Such schemes could link together directly, with regulators agreeing to full or limited fungibility of units between schemes. Units would then be traded between installations covered under different national pledge boundaries. Countries may then seek to count such units directly towards national pledges. Otherwise, a trading scheme in which entities make net purchases of units from another country would be less effective at moving the country towards the national pledge. This is because the “effort” companies make in purchasing overseas allowances would not be reflected by a reduction in national emissions inventory. In the case of the EU ETS this has not been a problem because each trade is backed by an equivalent exchange of national AAUs.

If ETS units are used to help meet national pledges in this way, it is important that the accounting system be designed to provide assurance of the quality of such units in the absence of a common international allowance unit. One way would be to encourage countries to directly account for ETS units within their pledge. The pledge total would then effectively increase or decrease if there was a net inflow or outflow of ETS units to or from linked ETSs across the border (most likely measured in aggregate by the ETS’s own tracking system). At the time of demonstrating achievement of its pledge, each country would need to make up any national shortfall by buying international offsets at the government level. Another means might be to impose some level of UN coordination or standards on ETS units, but some countries may see this as too intrusive on national policy making.

**Country-led Crediting Mechanisms**

New crediting mechanisms are likely to be launched outside of the KP. Such mechanisms might be organised and regulated through the UNFCCC process in a similar fashion to the CDM, as per the COP 16 mandate described in footnote 1. For UNFCCC-regulated mechanisms, it is likely that centrally-agreed rules would be in accordance with principles for new market mechanisms outlined in the Cancun Agreements. The principles state, inter alia, that mechanisms should lead to a “net global reduction in GHG emissions” and “broad sectoral coverage”. These concepts mean that the rules would likely be quite different to the existing CDM modalities, because overall emissions reductions in the host country would have to be greater than those used as offset credits in buyer countries. A certification approach based on actions being additional to business-as-usual would no longer be appropriate, and countries would need to agree on how to ensure that overall abatement exceeds the quantity of traded credits.

It is also possible that countries will develop and operate their own mechanisms and seek recognition for the resulting units to help with achieving UNFCCC pledges; for example, Japan is exploring bilateral crediting projects. A decision that country-led mechanisms can be used for meeting pledges would be a distinct departure from the KP mechanisms. A key question is how to keep some level of international co-ordination of such mechanisms in order that overall environmental integrity and market stability is balanced with flexibility for national circumstances.

One means for achieving this would be for UNFCCC Parties to agree common standards for country-led crediting mechanisms, with only units from mechanisms meeting the standards recognised as eligible for use towards UNFCCC pledges. The design and operation of mechanisms would be the responsibility of individual countries and the detail and level of stringency of the agreed standards would be a matter for negotiation. Such standards could include an environmental quality test which could allow countries to choose from a range of options on how they require mechanism participants to prove the environmental value of their units. The agreed standards could conceivably be extended to encourage “net global reductions” in emissions, either through a requirement for demonstrably ambitious crediting baselines or through controls in the tracking system, as described below.

From a market perspective, a system of common standards could help to facilitate project development as there would likely be a similarity in qualification requirements between

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[4] Note that from 1 Jan 2012, EU ETS units will no longer be directly converted from AAUs.

What is happening around UNFCCC’s negotiation?

schemes. This continuity may also cause a convergence in market value of units, although experience from the pre-2012 carbon market suggests that fungibility would only be achieved if units are eligible for direct use in linked domestic trading schemes, rather than being eligible for governments to meet national pledges.

An approach with less international assurance of unit quality would be for countries to agree only on minimum standards for transparency and information disclosure. All credits issued under country-led crediting agreements would be eligible for meeting national pledges, provided that full documentation is made public detailing how credits are generated. Although providing flexibility for countries to develop schemes to meet their own requirements, this approach would likely have serious pitfalls. The international community, including project developers, would have no guarantee of the environmental quality of the units involved. Aside from the environmental risk that such a market may not deliver the overall aim of reducing GHG emissions, it may also lead to a lack of market comparability between units. Furthermore, the likely divergence of crediting standards under this approach could raise overall transaction costs.

Keeping Track of Units
With the potential for so many new unit types, a robust system to track international unit transactions will be crucial to provide transparency and traceability of unit flows. The International Transaction Log (ITL) currently serves this purpose for the KP mechanisms by linking together national unit registries and the CDM registry. The ITL is programmed to check the integrity of each transaction – for example, to avoid duplicates – and also to check if certain KP accounting rules would be infringed by the transaction. If the KP enters a second commitment period for some countries, the ITL would most likely continue with most of its functions. It could, however, also serve as a tracking device for mechanisms operating outside of the KP, including country-led mechanisms.

For the ITL to be used in this way, countries could agree to maintain unit registries according to international specifications, with developing countries also encouraged to establish registries if they wish to participate in new mechanisms. The ITL could then act as a central hub to facilitate communication and record transactions of all units that are deemed eligible for meeting national pledges. In addition, countries may agree that the ITL continues to provide some form of integrity check for units, to provide an extra level of international control over the exchange of country-led units. Such checks could be linked to the agreed common standards for crediting mechanisms described above; for example, the ITL could ensure that a portion of credits issued for a particular action are retained by the host country, thereby ensuring a net global decrease of emissions “beyond offsetting”.

Conclusion
Regardless of whether or not the KP enters a new commitment period, it is likely that some countries will want to continue to exchange international GHG units to help meet mitigation targets outside of the KP. This could involve a wide array of new unit types, so an important concern is the maintenance of environmental integrity and how this can be assured whilst providing flexibility for countries to meet mitigation targets. A robust unit accounting system is essential for ensuring that markets continue to provide cost-effective means to meet mitigation targets in a transparent manner.

The OECD
is a unique forum where the governments of 30 democracies work together to address the economic, social and environmental challenges of globalization. It provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to coordinate domestic and international policies. The OECD and IEA jointly provide the secretariat for the Climate Change Expert Group, which oversees the development of analytical papers for the purpose of providing useful and timely input to the climate change negotiations. See www.oecd.org/env/cc/ccxg
Almost all of us agree that we need to do much more. To get on track for a maximum increase of 2°C we need to engage a much larger proportion of, if not all of the global economy in emission reduction activities. This is the topic of discussion for the Ad Hoc Working Group (AWG) on Long-Term Co-operative Action (LCA), the negotiation track of the Bali Action Plan. The other track, the AWG on the Kyoto Protocol, is seeking further agreement on a second commitment period. Both tracks have an interest in new mechanisms.

The topic of new mechanisms is important because in political terms it extends beyond the scope of the Kyoto Protocol (KP) and into the realm of long-term co-operative action (LCA); in practical terms it extends beyond the tiny proportion of the global economy which is currently touched by the KP – 3180 odd CDM projects at one end of the scale and the economies of a handful of developed countries at the other. For this reason, the two negotiation tracks cannot move forward in isolation. Reforming and expanding the CDM, for example, by applying the already agreed concept of standardized baselines may create project types which are also feasible under new mechanisms of the LCA. Benchmarking, for example, is an approach which could fit into the definition of standardized baselines and be applied under the CDM amongst a population of willing participants. Benchmarking can also be applied as the basis for allocating carbon units within a border voluntary or mandatory emissions trading scheme (for example, as benchmarking is now being applied in the EU ETS).

However, two additional facts have not escaped many observers:

1) New mechanisms are not much use if there is no increase in demand. As things currently stand, the demand from the EU ETS is already pretty much satisfied by the projected yields from the existing pipeline of registered projects.

2) The use of international emission reduction credits as pure offsets is rapidly going out of fashion.

The central theme of our proposal is to focus less on the Annex 1 / Non-Annex 1 split (though this remains a useful way of deciding which economies are willing to take on an economy-wide cap) and look more closely at the individual sectors of an economy. This is a much more technically appropriate approach and it immediately provides much greater flexibility for an economy to adopt a range of different types of actions whilst still recognizing their common-but-differentiated responsibilities.

So to recap, we need new mechanisms to build around the existing framework of the KP and extend into the realm of the LCA; we need to ensure that these mechanisms move away from the concept of crediting everything and we need to create additional demand.

The feature which defines the kinds of actions which a sector can undertake is its institutional infrastructure. Sectors of the economy which have a low level of institutional infrastructure lack the ability to take advantage of more demanding mechanisms and are effectively restricted to the CDM as we know it today. More advanced sectors of the economy can do substantially more – in terms of benefits, this means more emission reductions, more investment, more technology transfer and more sustainable development benefits. It is essential that Host Country Governments spend long enough thinking about these new mechanisms to recognize that they are not a threat to their sovereignty, but rather an opportunity to attract investment and technology transfer, with many associated benefits.

The CDM is an ideal mechanism for those sectors of the economy that lack any significant institutional infrastructure. The term institutional infrastructure refers to the ability for an administration to implement regulations, permit activities, monitor performance and gather reliable performance data. To develop a CDM project, all the host country needs to do is issue a host country letter of approval. Nothing else is essential. The rest of the work is done by the Project Participants, the Designated Operational Entities (DOEs), the UNFCCC Secretariat and the CDM Executive Board (EB). And for this reason, there will always be a demand for a CDM style mechanism.

But for those sectors which can do some of the administrative actions above, much more can be gained. The CDM has successfully motivated significant amounts of investment under difficult circumstances. Imagine, then, how much more investment could be mobilized under different types of mechanisms designed to provide increased certainty with reduced transaction costs.
The mechanisms we propose include:

1) Reformed CDM – reformed by the inclusion of standardized baselines which open the way to several new approaches to additionality and, in particular, methodologies which provide opportunities for, for example, energy efficiency technologies, energy efficiency in the built environment, and better “distributed” projects which typically reach out to large and rural populations. This is a mechanism that can now target the least developed sectors of an economy.

2) Benchmarking: This overlaps a little with the reformed CDM incorporating standardized baselines, but also requires a reasonable level of institutional infrastructure, for example the ability to identify the population, stratify, calculate the benchmarks and monitor performance, and depending on the design of the scheme, administer any resulting emission reductions. Depending on how the benchmark is defined, this mechanism can create a blend of domestic and international credits and can help a host country develop better institutional infrastructure and/or implement domestic policies. For example, where the benchmark is set at the level of an aspiring domestic regulation (i.e. a regulation that has been set but cannot be met for lack of technology or financing), domestic credits are awarded for the shift from business as usual performance to the benchmark, and international credits are awarded for exceeding the benchmark. Thus a benchmark mechanism can deliver a number of policy goals and help strengthen institutional infrastructure at the same time.

3) A Crediting baseline mechanism sets a target for an entire sector of the economy and, for example, by way of a domestic emission trading scheme (ETS), engages with all of the facilities within the sector. This approach increases the scope of participation significantly, moving from voluntary (under a benchmark) to mandatory participation (but not mandatory caps). Establishing a crediting baseline requires the ability to make macro-economic projections of activity levels for the given sector. This alone implies a significantly higher level of institutional infrastructure than that required for benchmarking. There are a number of important features:
   • If a voluntary crediting baseline mechanism or ETS fails to meet its target then the host country has no international penalty; if it succeeds in beating its target and generating unsurrendered allowances, these may be sold internationally.
   • The approach suits sectors which are maturing and getting “fitter” – i.e. getting closer to the day when they can take a mandatory cap and break the all important link between growth in economic output and growth in GHG emissions.
4) For countries that possess highly developed sectors within a diverse economy, there is an opportunity to engage in mandatory sectoral emission trading schemes. These schemes are for mature sectors that have reached or are close to their capacity and achieve growth largely through efficiency gains. Whilst these are the most demanding sectoral actions, they are also the most rewarding for the host economy. Creating high value compliance units creates assets that can be used to finance new technology. For example, EUAs (EU Allowance Units) were an important source of finance during the recent economic crisis. However, mandatory emission trading schemes also have another very important function. They have the ability to create demand for international or domestic credits from sectors that do not fall under the emission trading scheme.

<table>
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<th>Table 1: Summary of the New Mechanisms</th>
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<td>CDM</td>
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<td>Capital and technology deployment</td>
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5) Finally, at the top of the range, we have economy wide caps. These are the most demanding actions for the most developed economies – they force the host country to break the link between economic growth and GHG emissions across the whole economy. Clearly this is a demanding target and not for the faint hearted. Several Annex 1 countries have already baulked at the task.

Applying these mechanisms on a sectoral basis means that there is no reason why a Non-Annex 1 country could not engage in CDM for its domestic sector (e.g. biomass fired cook stoves) whilst also running a mandatory emissions trading scheme for its power sector. The logical conclusion of this proposal is that all countries identify the current level of institutional infrastructure within the sectors of their economy and then select and implement the most appropriate mechanism. In this way, a much larger proportion of the global economy can be brought under GHG emission management. Those sectors that enter a mandatory scheme create potential demand. The level of the cap is set via negotiated targets, and caps can be set which allow an increase in total emissions.

To be clear, this is NOT a route to global caps on emissions. But it IS a pathway to get the entire global economy onto a GHG emission management structure. Sectors are expected to get on board now and move from one level to the next over decades, not years. Each mechanism offers increasingly powerful opportunities to mobilize finance and technology. And it is also worth noting that the biggest winners in many of these situations are the host governments themselves. Mechanisms that reduce the demand for energy have far reaching benefits. Where fossil fuels are imported at international prices or domestically produced and consumed at unrealistically low prices; where the host governments build power stations and install capacity to meet peak demand and where electricity is transported through over-stretched grids… many state owned enterprises and governments pick up the tab. So when we write that sectors with poor institutional infrastructure lack the ability to take advantage of more advanced mechanisms, we mean just that. More advanced mechanisms provide unparalleled opportunities for the deployment of finance and technology. If implemented in conjunction with emission trading schemes or caps in the most developed sectors and further or on-going economy wide caps, our new mechanisms can complement the Kyoto Protocol, create demand and move away from pure offsetting.

In conclusion, we see new mechanisms as a means of addressing the polarity in the current climate change negotiations. New mechanisms provide a means for developing and advanced developed countries to start to participate in the management of GHG emissions and at the same time, provide a means for developed countries to bring an increasing proportion of their economies under caps, but without forcing them to bring the whole economy. Recognizing that different mechanisms are suited to different sectors of the global economy provides much greater flexibility to all parties. We have also highlighted a range of wider economic and macroeconomic benefits associated with the control of GHG emissions and we believe that these should be seen as broadly coinciding with the development objectives of many countries rather than as a means of placing a cap on GHG emissions from developing countries. We urge the Parties to carefully consider the benefits that new market based mechanisms can bring to the management of GHG emissions across the entire global economy.

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The provision of climate finance to developing countries continues to be a crucial and controversial issue in the international climate and development policy arena. Developed countries agreed on a significant scaling up of climate finance to developing countries at COP16 in Cancún. A sum of $100 billion per year shall be mobilized by 2020, which is roughly equivalent to 2010 official development assistance (ODA) of $129 billion. However, it remains a matter of debate how the limited public resources could be used most effectively.

This is a twofold challenge. On one hand, climate finance needs to leverage private sector action and investment at scale, as the investment needs for mitigation and adaptation in developing countries exceed the public budgets. On the other hand, effective delivery of public climate finance is key to achieving large-scale sustainable impacts.

This article therefore looks at two issues that are crucial for “making climate finance work” for developing countries: engaging the private sector and delivering public climate finance effectively.

**Engaging the Private Sector**

The private sector plays a vital role in tackling global climate change - as a driver of technology innovation, as a supplier and buyer of low carbon technologies, or as a provider of finance for mitigation and adaptation projects and programmes. According to UNCTAD, low-carbon FDI flowing into developing countries was nearly $20 billion per year on average between 2003 and 2009, mainly due to large emerging markets. Furthermore, UNEP reports $72 billion of domestic and international renewable energy investment in emerging economies in 2010, which for the first time is slightly higher than what was spent in developed countries.

While these are large numbers, they are far from the required amount. The additional costs for mitigation and adaptation in developing countries have been estimated roughly between $140 billion and $175 billion a year by 2030 with the underlying investment being 2-3 times bigger. Estimates on adaptation costs range from $50 to $100 billion. This indicates that even if $100 billion of climate finance pledged by developed countries can be delivered, more funding will be needed.

Climate negotiators are well aware of this challenge and of the fact that mobilising private capital will be crucial in achieving it. At the climate talks, the EU and other developed countries have emphasized that the private sector as well as carbon market flows should contribute to the goal of mobilising $100 billion per year by 2020. Most developing countries agree on the vital role of private finance, however arguing that it should be clearly supplemental to public contributions, rather than replacing them. In addition, members of the transitional committee, which designs the operational details of the Green Climate Fund (GCF), are considering options to mobilise private finance directly into the GCF as well as options to catalyse private finance alongside GCF funding.

Notwithstanding the different perspectives on whether or how private finance should count towards the 100 billion target, the question is how climate funding could maximise the mobilisation of private climate change investment.

For private investors, the attractiveness of an investment is primarily a function of the expected returns and the risk. Both factors have to match. However, the attractiveness of private mitigation and adaptation investment in developing countries is inhibited by a wide range of barriers such as: unattractive investment climate (e.g. fossil energy subsidies, country and foreign exchange risks), inadequate access to finance (e.g. due to weak domestic equity and debt markets, incomplete insurance markets to hedge against losses), insufficient risk-adjusted returns (some mitigation and adaptation projects are more costly or risky than non-climate friendly or climate proofed alternatives) or limitations in knowledge and capacity among relevant actors (e.g. bankers’ understanding of technologies being used in low-carbon projects might be limited; lack of capacity to design financially sound projects).
Possible interventions to address such investment barriers can be broadly distinguished between public finance mechanisms (PFM) and interventions to strengthen domestic investment environments. PFM are publicly backed interventions that help to close financing gaps, overcome market barriers and accelerate the uptake of relevant technologies. They include, for example, equity and debt co-financing instruments to lower the cost of capital or publicly backed guarantees to mitigate investment risks.

A favourable investment environment is key precondition for attracting private investment. Without it, PFM can hardly be successful at leveraging large flows of private investment. In countries that lack a strong framework, climate funding should focus on assisting governments in the development of appropriate climate policy and regulatory environments (e.g. by preparing a low-carbon development strategy). This task includes addressing the knowledge and capacity gaps of local public and financial institutions by providing specialist expertise, training and awareness raising. Such capacity building efforts may also target the private sector in a country.

Besides the investment climate, further important factors for effective PFM are the level of sophistication of a country’s financial sector and the size of the domestic market.

A recent study prepared on behalf of GIZ examined low carbon public finance mechanisms in six countries (Brazil, Costa Rica, India, Morocco, Namibia, Thailand, Vietnam). While these countries have relatively well developed financial markets in relation to the developing world as a whole, the study found large variation in PFM-related activity. While emerging economies like India and Brazil have implemented a large and sophisticated range of PFM to stimulate the creation of national low carbon business, PFM are barely applied in Namibia and Vietnam. Thailand, Costa Rica and Morocco are in the mid-range.

One explanation for these differences is the variation in country size. India and Brazil are large enough to have significant domestic markets for low carbon technologies – which offers the opportunity for active industrial policy in favor of creating national low carbon businesses. However, the different levels of PFM activity also reflect differences in climate policy commitment which is less visible in Namibia and Vietnam.

**A Programmatic Country-based Approach**

Providers of public climate finance can choose from a large menu of potential PFM to leverage private investment. However, choosing the appropriate instruments is not straightforward. Each country is unique in terms of its risks and barriers for private climate change investment. Technologies have heterogeneous risk profiles.

Against this background, the aforementioned GIZ study recommends that public finance instruments to mobilize private investment should employ a package of financing instruments, tailored to the national context rather than a single or one-size-fits-all instrument.

In order to have the most far reaching impact, such package or program of PFM should first and foremost be designed in close partnership with the recipient country and relevant local stakeholder in order to ensure nationally appropriate solutions and ownership. Secondly, it should be delivered under comprehensive low carbon development strategies in order to maximize the impact on climate and development goals. Thirdly, the program should be flexible so that it can be customized appropriately as country conditions progress.

Raising billion dollars of climate finance and leveraging private sector finance is absolutely necessary but will not save the climate, unless the funding is spent effectively. But what does effective delivery of climate finance mean? What challenges does it pose to both national governments and the international donor community? The following section will present the OECD activities as the most prominent approach for climate finance effectiveness for donor and recipient countries alike. Furthermore, examples and challenges of how effective delivery of climate finance is currently put into practice will be discussed.

**Delivering Public Climate Finance Effectively**

Climate finance provides large amounts of external funding from developed to developing countries and is therefore not that different from other forms of external funding, such as development assistance. It is, however, unique in terms of its expected scale, its institutional complexity and the global and cross-sectoral nature of climate change. In order to avoid climate finance outcomes that are undermining development goals, it is critical that the lessons, be they positive or negative, from the last 50 years of development cooperation are applied to climate financing. In this regard, various initiatives at political level between the development and climate communities have been initiated.

At the international level, the Secretariat of OECD’s Development Assistance Committee has been developing effectiveness approaches to climate financing. Work to date has taken place in Asia, Africa and the Pacific which resulted in several country analysis, case studies, and the so-called Bangkok Call for Action (October 2010)—a set of common principles for climate change finance.

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7 GIZ 2011
8 OECD, 2010 and 2011
The Bangkok Call to Action addresses the private sector among other issues in three of its four sets of recommendations. As such, governments are asked to include the private sector into financing frameworks and to establish an enabling environment for private sector investment to support climate-resilient, low-carbon growth and the transition to a green economy. International funders are encouraged to cooperate with the private sector to ensure that funding is coherent for the climate change response.

The OECD country analysis reaffirmed the need for enhanced co-ordination among different financing sources. They also emphasized the necessity to strengthen public financial management systems, which will allow donors to work through national country systems. This will require country ownership and better donor co-ordination at country level. While primary progress has been made, the analysis also showed that more political leadership is required because climate change in many countries is not viewed as a domestic political priority. In addition, the OECD discussions have shown that a common language and understanding of the development and climate communities is needed. Currently, both communities use different terms for similar effectiveness criteria which can be a barrier for fruitful exchange and learning from decades of development experience.

A common language on effectiveness criteria in both communities would further contribute to a new paradigm of aid quality, as opposed to aid quantity. To this end, accountability, transparency and results are the emerging themes for the upcoming 4th High Level Forum on Aid Effectiveness that will take place in Busan, Korea end of November 2011.

Climate Finance Effectiveness in Practice

Currently, the complex international finance architecture works via a set of multilateral implementing entities such as the UN agencies and development banks, leaving national structures aside. By using own fiduciary standards and reporting requirements, multilateral entities seek to ensure a transparent and effective use of public climate finance. In view of increased future volumes of climate finance and enhanced alignment with partner countries as stipulated by the Paris Declaration on Aid Effectiveness (2005), national government organizations will play a key role. More public climate funding is expected to be channelled through and implemented by them in the mid and long term. This is likely to challenge the administrative structures and absorptive capacities of recipient governments. Recipient government entities will need to comply with standards of good financial governance and demonstrate their ability to effectively and efficiently manage climate change programmes along the project cycle.

The Adaptation Fund (AF) is a prominent example where ownership, the core principle of aid effectiveness, is being put into practice. Here, developing countries are already in the driver’s seat for fund access and project management. 50% of the AF’s funding is reserved for “direct access” of national institutions (so-called “National Implementing Entities” (NIEs)). NIEs are responsible for project and financial management, thus taking on a role that is comparable to multilateral implementing organisations such as UNDP or the World Bank. So far, the accreditation process has been rather slow—with only five institutions being accredited—which shows that the set of fiduciary standards to be fulfilled (“Financial management and integrity”, “Institutional capacity”, and “Transparency, self-investigative powers and anti-corruption measures”) is challenging. The AF’s experiences with direct access are of great importance for the future climate finance architecture, as it is most likely to become a main feature of future funding mechanisms, such as the Green Climate Fund.10

Conclusion

As outlined in this article, climate finance is a multi-layered issue, especially in terms of mobilisation and delivery of funding. On the one hand, the international community needs to strive to close the financing gap; a task that can only be done with major investments coming from the private sector. In this framework, the public sector plays a crucial role to provide enabling policy frameworks and tailor-made PFM programmes that leverage private finance.

On the other hand, international donors should support government entities in recipient countries in building up the required administrative and financial capacities to deliver climate finance effectively. In this context, technical assistance can support recipient countries with developing capacities on good financial governance and introducing effective monitoring and evaluation systems, based on the international community’s collective approaches to improve effectiveness. Promoting a transparent public financial management in recipient countries and identifying cost-efficient adaptation and mitigation measures could be first valuable measures to enhance climate finance efficiency.

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9 Lessons from experience within the development community have been refined over the last decade in Monterrey (2002), Paris (2005) and Accra (2008) into the “principles of aid effectiveness”, namely ownership, alignment, harmonization, managing for results and mutual accountability. In comparison, the common principles of the climate community are adequacy, predictability, sustainability, equity, common but differentiated responsibilities and respective capabilities and measurability. These principles emerged from the negotiations on revenue generation within the contact group on finance and coincide with the aforementioned Paris principles.

10 Schalatek, 2011
Responses to climate change and development are inseparable. Climate change financing has been recognised as a key element of external development finance. Therefore, the experiences from development cooperation over the past 50 years can provide valuable insights into aid effectiveness. Upcoming key milestones for the international political framework on effectiveness and sustainability will be the conferences in Busan (4th High Level Forum on Aid Effectiveness), and Rio de Janeiro (Rio+20). Together with the international UN climate change negotiations in Durban (COP17), they represent unique opportunities to build trust and bridge the gap between environment, development and finance communities. Sustainable development and poverty eradication will be achieved in view of a changing climate only if the international community manages to leverage additional private funding and make public climate finance delivery more effective.

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About GIZ
The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH was formed on 1 January 2011. It brings together the long-standing expertise of the Deutscher Entwicklungsdienst (DED) gGmbH (German development service), the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German technical cooperation) and InWEnt – Capacity Building International, Germany. As a federally owned enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

Within the context of the UN climate negotiations, GIZ provides expert advice and support to the German Federal Ministry for Economic Cooperation and Development (BMZ) and other German ministries. The organisation also develops concepts for mainstreaming climate change mitigation and adaptation in development cooperation. In addition, GIZ undertakes practical activities in the partner countries in the field of climate change. These span almost all development sectors, including energy, agriculture, water, and industrial and urban development. On behalf of BMZ, GIZ systematically carries out environmental and climate assessments to ensure new projects are ‘climate safe’.
The Clean Development Mechanism (CDM) has been a qualified success, promoting over 7900 projects globally, catalysing project activity, international cooperation, private sector investment, skills and technology transfer. The CDM has provided a major boost to some project types and sectors (some of which such as the industrial gases have been controversial), which had no other significant means of funding. The mechanism has not been without its problems however, due at least in part to the design as a bottom up mechanism with the rules and procedures developed over time, involving several stakeholder groups and approved afterwards by the CDM Executive Board (EB). Many of the procedures and modalities have been criticised, particularly by the private sector, as overly bureaucratic and in the worst cases, choking off investment in certain project types and circumstances. In addition, there has been a call for incentives to address the real and perceived imbalances in geographical distribution, benefiting the large middle income countries rather than the least developed countries.

In response to a demand for geographical equity and a clamour for reform, a number of improvements have been enacted in the last 12 months to address these concerns. This article summarises some of these, and looks qualitatively at the potential impact of these two drivers, particularly for the poorest countries.

Improving the Distribution of Project Activity
As was already apparent in the distribution of CDM project development by then, the Nairobi Framework of Action was adopted in 2006 specifically to improve the geographic coverage of the CDM for the poorest countries, described in UN parlance as Least Developed Countries (LDCs), particularly in sub-Saharan Africa. Since then, there have been a slew of efforts, principally by public sector actors, to build capacity and enhance project development in these regions. Many of the countries will still be eligible for access to the EU’s Emission Trading Scheme, after 2013, so these efforts are certainly not wasted. Furthermore, there have been a number of initiatives described below to address the distribution issue. Most of these are not new and their adoption has been long overdue.

In order to reduce transaction costs in under-represented countries, a loan scheme to cover the preparation, validation and first verification of CDM documentation and some deferred payment of registration fees was agreed at the Copenhagen meeting (COP 15, late 2009) for countries having less than 10 registered project activities. The scheme is, at the time of writing, not yet launched, but could have benefits for least developed countries, particularly in conjunction with some of the methodological and additionality simplifications described elsewhere in this article.

There has been an identified need for the development of methodologies with potential application in the poorest countries, for both the conventional CDM and the Programmes of Activity. Project proponents have responded to this call. Examples of innovation in these areas include the recent development of a small scale methodology for water savings devices and replacement of fossil fuel fired stoves by biomass stoves. Many of the poorest countries have inherently low emissions due to reliance on hydropower, biomass and in some cases imports of coal based power, which are accounted for as emissions free. In many cases, these countries have significant potential for biomass and household based CDM activities and programmes of activity (PoA). In the last 12 months, a number of methodological reforms have been implemented which will have a significant impact on potential supply of CERs from the poorest countries. More are required, for example, in the area of materiality and the margin of error for verifying emissions. However, the EB and its panels have prioritised work in this area, and these efforts are beginning to bear fruit.

Guidelines for treatment of suppressed demand in baseline methodologies have been agreed by the EB in July 2011. These are particularly relevant for poorest countries where levels of consumption are very low (“suppressed”) in the absence of available inputs, such as use of electricity in rural areas, but this is deemed under current methodologies to represent the baseline. To make this more equitable, the approved rules define a minimum level of service based on international or national development goals, which could then be used for setting a fairer baseline. Although this is a “work in progress”, as actual benchmarks are not defined, this methodological reform will benefit the poorest countries affected by this phenomenon.

At the July 2011 meeting, the Executive Board also agreed on principles for sector specific standardised baselines, which established benchmark setting and simplified additionality determination for four project categories, including fuel switching and technology switch. Although benefiting not only the
poorest countries, standardised baselines will reduce time spent in the project cycle and therefore transaction costs. Although much work will be required to operationalise this decision, for instance through setting benchmark levels, determining data requirements and collection frequency thereof, this could be an important step forward.

So-called “microscale” project activities, defined as renewable energy projects ≤ 5MW p.a. and energy efficiency projects with energy savings ≤ 20GWh p.a. and other project below 20.000 tCO2e p.a., located in LDCs or Small Island Countries will benefit from simplified and automatic additionality demonstration. This important development has the potential to boost project development in these countries, although it will also be a boon for the more advanced developing countries such as India, where there has been a lot of small and microscale renewable energy development, but where projects have often struggled to demonstrate additionality.

There have also been developments in the programmatic CDM or Programme of Activities (PoAs). The much maligned procedures and designated operational entity (DOE) liability for review of erroneous inclusion of a CDM Programme Activity (CPA) into a PoA were revised, effectively reducing the risks for DOEs to engage in this category of projects. This overcomes a key barrier to PoAs and should result in lower costs. Geographic distribution of PoAs is already relatively wide, with a quarter of all projects located in Africa at the time of writing.

Given that many countries in sub saharan Africa have significant potential in the areas of forestry, agriculture and land use change activities, recent developments and funding for REDD+ will have a major impact on these countries, and redress the balance of distribution inequity. Financial resources from bilateral (e.g. Norway) and multilateral sources are being mobilised.

**Reform of the CDM**

In the years that followed the Nairobi Framework the voices arguing for reform grew, particularly from project developers in order to make the project cycle processes more predictable and reduce uncertainties in the validation and registration processes. Industry groups such as IETA, the Carbon Markets and Investors Association and the Project Developers Forum were established to represent these concerns and lobby for change. There was also a demand to speed up and simplify modalities thereby reducing transaction costs which were spiralling out of control. Much has been achieved since then, demonstrating the system’s ability to accept and respond to criticism.

Following calls from project developers, plans proposed at the Cancún meeting in late 2010 to enable projects to earn credits from the date of their request for registration were submitted, rather than when they approved (a process over which developers have little influence) were operationalised in February 2011. Since the projects had taken several months to get through even the final stages of registration, this allows developers to earn more credits and thereby increase financial flows to eligible projects.

There have also been improved channels for direct communication with stakeholders including designated national authorities, designated operational entities, project participants and representatives of civil society. On a project basis, one outcome of this development could be the reduction of the amount of submission requests rejected due to incompleteness, speeding up the process, reducing uncertainty and increasing access to finance. More broadly, these changes will benefit the process going forward and ensure the mechanism develops in line with the needs and expectations of market participants.

**Longer Term: Transitioning to NAMAs**

The biggest reform to the CDM could relate to the transition from individual projects to sector or economy wide measures, the so called Nationally Appropriate Mitigation Actions (NAMAs). Early work in this area is pointing to an emphasis on middle income developing countries. This is the thrust of EU policy, to develop sectoral crediting mechanisms, which are in practice likely to be most applicable for these countries rather than the poorest and promote “old CDM” for LDCs. The EU has stated its wish to argue for the establishment of new carbon market mechanisms with a broad or sectoral coverage at COP17 in Durban.

NAMAs are not a short term opportunity, with crediting NAMAs unlikely to generate saleable credits much before the middle of this decade. Instead, there is much activity in the area of market readiness, for example the NOAK-NEFCO Partnership Initiative or the various initiatives by the German Federal Ministry for Environment (BMU) and the World Bank Programme for Market Readiness. There are also strong arguments for harnessing the learning benefits of the PoA as a stepping stone to the structuring of the NAMA.

If history offers any precedent, future initiatives will likely follow which will enable larger scale financial flows, but for now the focus for the international community should be delivering CDM for the poorest countries and testing NAMA approaches with an emphasis on system design, and monitoring, reporting and verification processes.
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Potential Market Impacts of CCS on the CDM
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Acknowledgement/Preface: The research for this paper was carried out in the framework of the Dutch CCS research programme CATO2. We would like to thank Rodrigo Rivera Tinoco (MINES ParisTech) for his support in collecting and structuring the data used in this analysis.

Abstract
Currently, the Clean Development Mechanism (CDM) is the only international instrument that could provide a financial incentive for CCS in developing countries. In December 2010 it was decided that CCS could in principle be eligible under the CDM, provided a number of issues are resolved, including non-permanence, liability, monitoring and potential perverse outcomes.

The latter issue relates to the concern that CCS projects could flood the CDM market, thereby crowding out other technologies that could be considered more sustainable. This report therefore, aims to quantify the possible impact of CCS on the CDM market, in order to assess the relevance of the CDM market objection. However, the analysis in the report is also valid for the role of CCS in other types of international support mechanisms.

Using marginal abatement cost curves (MACCs) for technologies eligible for the CDM, including CCS, we estimate the economic potential for CCS projects to be 4-19% of the CDM credit supply in 2020. The uncertainty in these figures is, in addition to the uncertainty in the economic potential for CCS, predominantly a result of the lack of clarity with regard to the global carbon market after 2012, including the role of the CDM. The lower figure corresponds to the scenario where the CDM covers all the demand for international carbon offsets, and the higher figure refers to the possibility that only the European Union continues using the CDM after 2012.

Introduction
The Clean Development Mechanism (CDM) is a policy instrument that was developed in the framework of the Kyoto Protocol under the United National Climate Change Convention (UNFCCC) in 1997. The overall objective of the CDM is to facilitate a cost effective reduction of greenhouse gas emissions, while encouraging a flow of capital to developing countries to support sustainable development. Certified emission reductions (CERs) can only be generated via projects in developing countries (non-Annex I) that contribute to the reduction of greenhouse gas (GHG) emissions. As the CDM is a market mechanism, the price of a CER can fluctuate depending on supply and demand. Currently there are over 5000 CDM projects in the pipeline, expected to generate approximately 200 million CERs (equalling 0.2 GtCO₂-eq) in the period 2008-2012 (URC, 2010). Total annual greenhouse gas (GHG) emissions in developing countries in 2005 were approximately 25 GtCO₂-eq, which is about half the global total.

Currently the CDM is the only instrument that could provide an international financial incentive for investors to consider reducing CO₂ emissions through CCS in non-Annex I countries. Although CCS has been continually rejected as an eligible CDM project activity since the first methodology involving the technology was submitted to the CDM Executive Board in 2005, at COP16 in Cancún in December 2010 it was decided that CCS is in principle eligible under that CDM, provided certain conditions are met (UNFCCC, 2010).

This latter concern, i.e. the risk that CCS may unbalance the carbon market, stems from previous experiences with end-of-pipe GHG abatement technologies in the CDM. When the first CDM methodologies were approved in 2003, the bulk of the CERs were brought to the market by HFC-23 destruction activities. Such projects generated a large amount of credits for very low abatement costs, estimated to be as little as 0.5 $/tCO₂-eq (Schwank, 2004). Unsurprisingly, these cost effective technologies swamped the CDM project portfolio, depressing the CER price and effectively blocked investment in more expensive options such as renewable energy.

Assessment of Costs And Potentials
The assessment of the potential impact of CCS on the CDM market requires updated and realistic data on the carbon abatement potential by 2020. Previous work on this subject has been completed by Zakkour et al. (2008) and Bakker et al. (2010). The first stage of the assessment has been to develop a MACC for CCS in developing countries. The potential for CCS in developing countries is based on the IEA’s Technology Roadmap: Carbon Capture and Storage (IEA, 2009).

3 See Section 4.3 for a more detailed discussion of the COP16 decision.
4 Options in renewable energy at that period were estimated to require a minimum CER price of 4 $/tCO₂-eq (Schwank, 2004).
We used the following steps to build our MACC:

1. Retrieve CCS deployment projections from the IEA Roadmap, i.e. by world region and broad sectors.

2. Retrieve information on ongoing and planned CCS projects in developing countries.

3. Reconcile 1) and 2) in order to identify CCS potentials by country and sector.

Specific figures for CCS abatement potentials and costs are presented in Annex A and integrated into the cost curve in this chapter.

The IEA CCS roadmap does not include CCS in CTL plants before 2020. Zakkour and Cook (2010) estimate CTL emissions in China to be 3.6 MtCO2eq/yr and in South Africa 24 MtCO2eq/yr. In addition to the potential of CTL, the role of Enhanced Oil Recovery (EOR), when more oil is produced out of an existing field through injection of CO2, and therefore revenues are generated, is another important factor in the deployment of CCS in developing countries. Therefore we use three scenarios for our abatement cost curves:

1. IEA base case: Inclusion of CCS in power sector, ammonia, natural gas processing (NGP), iron and steel, biomass and cement industries, corresponding to the IEA CCS Roadmap.

2. IEA base case + CTL: Includes the deployment of CCS in CTL industry.

3. IEA base case + CTL + EOR: The use of CO2 for EOR exclusively in North Africa and Arabic countries 5 regions from the industries expressed in previous scenarios. In this scenario we assume that EOR reduces the abatement cost for CCS projects in those countries by 20$/ton CO2 6.

CDM Market Impact Of CCS

In addition to the CDM there may be other opportunities to support CCS in developing countries through carbon market mechanisms or other international instruments. These include bilateral and multilateral partnerships, potential non-UNFCCC carbon credit instruments and nationally appropriate mitigation action (NAMAs) which can be credited or supported without generating credits (Hagemann et al., 2010), see Figure 1.3. These other international instruments are thought to be important in the near future for CCS technology development and demonstration projects. In this CDM market assessment however our point of departure is that the CDM may cover the full CCS potential except EOR. In order to assess the potential impact of CCS on the CDM market in 2020, we encounter uncertainties regarding the CDM market post-2012. In order to deal with these we use a scenario approach, as described below and in more detail in Bakker et al. (2011).

First of all, we use four scenarios for the supply of CERs

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5 This region covers 57% of the non-Annex I CCS potential.
6 This is based on market prices for CO2 in EOR operations by Steidtmann (2007) and Advanced Resources International (2009) who report prices between $10 and $24. As these prices refer to relatively low oil prices, $20 per tonne of CO2 for 2020 can be considered conservative.
without CCS based on Bakker et al. (2007) and a demand of 500-1700 MCER/yr in 2020 (UNFCCC, 2008). Secondly, to assess the impact of CCS on the CDM market in terms of supply of CERs and the CER price we develop four scenarios, based on the following considerations:

**Figure 1.2** Shows the Abatement Cost Curves for CCS in Developing Countries in 2020 for These Three Scenarios

![Cost Curves](cost_curves.png)

**Figure 1.3** Mobilisation of the CCS Potential Through Different Post-2012 Mechanisms

![Mobilisation Diagram](mobilisation_diagram.png)
The role of the CDM versus other possible post-2012 carbon market mechanisms. It is possible that the CDM is used only by the EU, while other developed countries use other mechanisms, which would result in a “fragmented” market. One the other hand, it is possible that the CDM is the only carbon credit mechanism in 2020 and therefore used by all developed countries, thereby covering the full demand for carbon credits (“CDM only”).

Market dynamics: the CER price impact depends on the functioning of the market. “Low responsiveness” refers to the possibility that additional supply potential of credits would have no or a small impact on the CER prices, while in “high” responsiveness a supply increase has a downward impact on prices.

For the additional supply of credits due to CCS in the CDM we use the two supply curves from Section 1 that do not include EOR, as this storage technology is unlikely to be eligible under the CDM. The share of the CER supply by CCS is based on the assumption that the CER demand of 500 or 1700 MtCO₂ can be met by a supply of projects that include all project types up to an abatement cost of €30/tCO₂. This assumption is in accordance with the approach used in Bakker et al. (2010) and the analysis by Castro (2010), which shows that the current CDM portfolio includes projects from different abatement cost categories, from negative to $40 per tonne of CO₂-eq, and to a limited extent from higher cost categories.

The potential CER price impacts of CCS in case of the “high responsiveness” / “CDM only” scenario are based on a low demand estimate of 500 MCER. The impact is likely to be zero, as this demand can be met by no-regret options. In practice these options may not be realised due to non-financial barriers (Bakker et al., 2007), however the impact of the low-cost CCS options is not likely to be significant.

For the high demand estimate of 1700 million CERs, there could be a CER price effect. Without CCS the CER market price is estimated to be approximately $12-36. With CCS (potential 50 Mt up to $30/tCO₂) the CER supply could increase, resulting in a downward effect of $0-4. For the Fragmented Market scenario no meaningful CER price impact assessment was possible. Table 1 summarises these results.

### Discussion and Conclusions

In order to characterise the opportunities for CCS in developing countries, we developed a marginal abatement cost curve. After a review of existing studies related to CCS potentials and scenarios in developing countries, we considered the IEA CCS Roadmap to be the most suitable basis for preparing the CCS MAC in 2020. This Roadmap can be considered an optimistic scenario for CCS, as the technology is still in an early stage (compared to e.g. wind energy) and achieving the projections for 2020 is far from an easy task. However, as it considers ongoing and planned CCS projects up to 2017, it is also a realistic scenario.

Using this approach, the potential for CCS deployment in developing countries with abatement costs up to $30/tCO₂ is estimated to be 70-100 MtCO₂/yr in 2020. The main part of this potential is in natural gas processing in Asian countries. CTL in South Africa may be an important option as well. It should be noted that the uncertainty in these figures is considerable, and is mostly related to the difficulty of making projections of CCS deployment (as done in the IEA Roadmap), to geological storage capacities, and to estimating the abatement costs.

Based on these figures for costs and potentials, we estimate CCS could take 4 – 19% of the CER supply in 2020. The CER price impact is estimated to be between 0 and 4 $/tCO₂, with higher probability (i.e. most of the scenarios) for the lower part of this range. It should be noted, however, that these results are based on the assumption that the CDM would be the only instrument providing an incentive for CCS deployment in developing countries. It could be that other instruments, such as bilateral partnerships, non-UNFCCC credit mechanisms and NAMAs also play a role in deployment of CCS.

### Table 1: Potential Impacts of CCS on the CDM Market

<table>
<thead>
<tr>
<th>Market responsiveness</th>
<th>CCS impact</th>
<th>Carbon market 2020 Fragmented</th>
<th>CDM only</th>
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<tr>
<td>Low</td>
<td>% of CER supply Δ $/tCO₂-eq</td>
<td>14-19% 0</td>
<td>4-5% 0</td>
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<tr>
<td>High</td>
<td>% of CER supply Δ $/tCO₂-eq</td>
<td>14-19% 0</td>
<td>4-5% 0</td>
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For the high demand estimate of 1700 million CERs, there could be a CER price effect. Without CCS the CER market price is estimated to be approximately $12-36. With CCS (potential 50 Mt up to $30/tCO₂) the CER supply could increase, resulting in a downward effect of $0-4. For the Fragmented Market scenario no meaningful CER price impact assessment was possible. Table 1 summarises these results.
## Annex A: MACC Data

<table>
<thead>
<tr>
<th>Country</th>
<th>Process Type</th>
<th>Potential in 2020</th>
<th>Cost Scenario 1</th>
<th>Cost Scenario 2</th>
<th>Cost Scenario 3</th>
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</tbody>
</table>
What is happening around UNFCCC’s negotiation?

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Voluntary markets or other global developments

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The UN-REDD Programme in Action

The UN-REDD Programme
is the United Nations Collaborative initiative on Reducing Emissions from Deforestation and forest Degradation in developing countries. The Programme was launched in September 2008 to assist developing countries prepare and implement national REDD+ strategies, and builds on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP).

The Programme supports nationally-led REDD+ processes and promotes the informed and meaningful involvement of all stakeholders, including Indigenous Peoples and other forest-dependent communities in national and international REDD+ implementation.

The Programme currently supports 35 partner countries spanning Africa, Asia-Pacific and Latin America, of which 13 are receiving direct support to their National REDD+ Programmes. As of September 2011, the UN-REDD Programme’s Policy Board has approved a total of US$55.4 million for these thirteen partner countries, which helps to support the development and implementation of national REDD+ strategies. Nine UN-REDD Programme partner countries are now in various stages of implementing their National REDD+ Programmes, namely Bolivia, DRC, Indonesia, Panama, PNG, Solomon Islands, Tanzania, Viet Nam and Zambia.

UN-REDD Programme partner countries not receiving direct support to National Programmes engage with the Programme in a number of ways, including as observers to the Programme’s Policy Board, and through participation in regional workshops and knowledge sharing, facilitated by the Programme’s interactive online workspace.

To date, Norway has contributed more than US$84 million to the UN-REDD Programme. Denmark contributed US$2 million to the Programme in June 2009 and another US$6 million in November 2010. Last year, Spain confirmed US$1.4 million for 2010 and in March 2011, Japan made its first funding commitment to the Programme of US$3 million. In terms of funding pledges, the European Commission has pledged approximately US$14 million (€10 million) and Norway has
pledged an additional US$20 million. The UN-REDD Programme is now actively looking for more donors to meet the increasing demand from countries seeking support from the Programme.

**The Evolution of REDD+**

The seed for the REDD+ mechanism was planted at COP11 in Montreal in 2005 when the governments of Papua New Guinea and Costa Rica introduced the concept of Reducing Emissions from Deforestation in developing countries (RED). The concept was referred to the Subsidiary Body on Scientific and Technical Advice (SBSTA) for elaboration. Since then, SBSTA has been discussing and addressing several important technical and methodological aspects of REDD+, from measurement, reporting and verification to governance and the definition and inclusion of safeguards. The 2007 Bali Action Plan consolidated and expanded the RED concept by including reference to policy approaches and positive incentives on issues relating to reducing emissions for deforestation and forest degradation (adding the second “D” to “REDD”) in developing countries, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries (adding the “+” to “REDD+”).

Despite a great deal of momentum and awareness-raising for REDD+ in 2009, COP15 in Copenhagen failed to produce a global legally binding climate change agreement including REDD+. With far less expectations for REDD+ heading into Cancun, countries came together in December 2010 to adopt a balanced package of agreements to support enhanced action on climate change, including the first-ever agreement defining the REDD+ mechanism from a policy perspective, under the UN Framework Convention on Climate Change (UNFCCC). While not all aspects of REDD+ are fully addressed, notably the financial aspects and the role of carbon markets, the architecture of the mechanism is now almost complete.

For the UN-REDD Programme and other actors involved in readiness and fast-start activities, the Cancun Agreements provide clear guidance on the scope of REDD+, and what work remains to be done. The Agreements provide some elaboration on the activities that developing countries need to undertake in the development and implementation of REDD+, such as a national plan, national reference emission levels, robust and transparent national forest monitoring systems, as well as governance and stakeholder engagement systems. All of these work areas are ones the UN-REDD Programme and other readiness initiatives have been supporting for the past two years.

To fully realize the potential of REDD+, countries will need to address some unresolved issues such as how reference emissions levels should be set, the definition of forests and degradation, and the relationship between REDD+ and nationally-appropriate mitigation actions (NAMAs). Also, as the REDD+ mechanism is fully defined, it will be critical to secure adequate and predictable funding for REDD+ to keep learning and implementation moving forward.

The biggest challenge for negotiators at COP17 in Durban will be reaching agreement on how to reduce emissions from all sectors and not just from forests. This will require greater commitment and ambition from all parties. Also, the Green Climate Fund is one of several significant decisions that countries reached at COP 16 in Mexico. At COP 17, the parties will need to agree on the first draft of the design of the Green Climate Fund, in addition to reaching agreement on REDD+ financing for phase III. All of this will have to be accompanied by funding commitments to the levels agreed in Cancun.

**Making the Case for REDD+**

REDD+ has brought forests back to centre stage, forcing a debate and a re-examination of issues related to Sustainable Forest Management. It has, for example, moved faster and garnered more consensus than virtually any other mitigation option in the UN Framework Convention on Climate Change (UNFCCC) negotiations over the past two years.

The REDD+ mechanism has also mobilized significant ‘fast start’ financial resources, which are facilitating a fresh look at the challenges associated with how forests can be managed in a way that can help reduce global emissions while benefitting people and forest ecosystem services. It is effectively enabling countries to drill deeper and define the role of forests in their national economic development, the amount of forests they need to preserve, and the transformation of their economies to low carbon.

In forest-rich countries, for example, it can be the catalyst for “negotiating” a balance between keeping forests intact and promoting economic development through land concessions for large-scale rubber, palm oil and sugar plantations with significant employment, earnings and export potential. It can similarly catalyze a critical look at the difficult trade-offs governments have to make between various policy options.

REDD+ could also provide opportunities for synergies between environmental and social benefits. It has provided a platform to many Indigenous Peoples and forest-dependent communities, enabling them to participate at the national and international levels. While initial progress may not have met expectations, this is facilitating dialogue and trust-building between them, the state and civil society organizations.

Ultimately, the issues critical to REDD+’s success are those which countries would have to deal with in achieving sustain-
"REDD+" refers to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.

ability, whether or not the mechanism existed. Irrespective of whether a nation ever trades a single ton of carbon, it needs a national debate about where its forests fit into national economic development policies. REDD+ is proving a critical catalyst for such a debate.

The launch of the REDD+ concept in 2008 was timely and visionary. The design of the mechanism and the Cancun agreements are a measure of the level of the international community’s commitment. REDD+ therefore presents a unique opportunity to respond to the challenge of reducing carbon emissions from forests while limiting any negative impacts on both the environment and people that might result from its design and implementation.
Actions Needed to Halt Deforestation And Promote Climate-Smart Agriculture
Eva Wollenberg, Bruce M. Campbell, Alison Nihart1, Peter Holmgren2, Frances Seymour3, Lindiwe Sibanda4, and Joachim von Braun5

Key messages
- Integrated action across Reduced Emissions from Deforestation and forest Degradation (REDD+) and agriculture is necessary to achieve mitigation and food security outcomes,
- ‘Climate-smart’ agriculture that achieves the triple-win of food security, adaptation and mitigation will strengthen the impacts of REDD+,
- REDD+ must address the needs of smallholder farmers to avoid exacerbating poverty and local food insecurity,
- Financing is currently insufficient for agriculture to tackle climate change and food security challenges in support of REDD+,
- Governance for forest conservation should include provisions for improved sustainability and productivity of agriculture,
- Agricultural development policies and REDD+ should be aligned with national climate change action plans,
- The role of forest-based ecosystem services in sustainable agriculture requires more recognition in land-use planning.

Introduction
Agriculture needs to feed 9 billion people by 2050. This will require a 70–100% increase in food production (Godfray et al. 2010). Given climate change, a new kind of agriculture is therefore essential, one that must meet the triple challenge not only of ensuring food security, but also of adapting to future climate change and contributing to climate change mitigation.

Meeting these challenges will require coordination with the mechanism known as Reduced Emissions from Deforestation and forest Degradation (REDD+) and other efforts to conserve forests. REDD+ will have to limit the expansion of agriculture if it is to be successful (Nepstad et al. 2009; DeFries et al. 2010). Agriculture is a primary driver of deforestation in most countries, including in Brazil and Indonesia, where 61% of global deforestation occurs. Projected increases in demand for food and bioenergy by 2050 will increase pressure on forests further (von Braun 2007).

However, restricting agricultural expansion could have negative consequences for food security and economic development. The needs for increased food production and economic development will be among the highest in countries in the tropics. Projections suggest that agricultural land reserves will be exhausted as early as the late 2020s, and almost certainly by 2050 (Lambin and Meyfroidt 2011).

In this chapter we examine actions that can help halt deforestation due to agricultural expansion while also achieving food security and economic development. We conclude with recommendations about how climate change mitigation can be achieved in an integrated way across the agricultural and forestry sectors.

Agriculture Is A Driver Of Deforestation
Agriculture contributes to about three-quarters of tropical deforestation (Figure 1). Although much of this deforestation is the result of both small-scale agriculture and industrial or commercial agriculture, ranching is also an important driver of deforestation. The drivers of deforestation differ significantly amongst regions and amongst countries within regions, which highlights the necessity of tailoring policies and plans for REDD+ and climate-smart agriculture to national and local contexts. Drivers also change over time, as demonstrated by the increasing importance of commercial agriculture globally.

Most studies of land-use change predict that the expansion of croplands and grasslands will continue to be the dominant cause of land-use change in the future (Smith et al. 2010). The crop area in low-income countries is expected to expand between 2–49% by 2050 (Balmford et al. 2005). Increasing population and dietary shifts will be the primary drivers of the demand for agricultural land, but biofuels are also a major po-
potential driver driven in turn by subsidies, fuel-mix standards, and other policy instruments (van Gelder and German 2011; Schoneveld et al. 2010). These trends are in direct conflict with policy aims to reduce climate change by avoiding the loss of carbon stored in tropical forests. In addition, forest loss has repercussions on local livelihoods and sustainable agriculture because of their role in the provision of important goods and services. Forests also can help buffer communities against the extreme weather events likely to become more frequent with climate change and are thus a critical element of adaptation strategies (Locatelli and Pramova 2011).

Future agricultural conversion will depend not only on the demand, for food but also on the manner in which it is produced, and the level of yields per hectare (land-use intensity). The use of improved technology, management and inputs such as fertilizer, pesticides and water has probably reduced the amount of land used to meet food needs in the past, although the extent of this reduction remains a matter of dispute. Globally, total crop yields – mostly cereal and oil crops – increased by 135% between 1961 and 2005 while cropland increased by only 27% (Burney et al. 2010). There is still vast potential for increasing productivity in many parts of the world, particularly in Africa. However, possible negative effects of intensification on the environment could weaken capacities to produce food in the long-run (Godfray et al. 2010). Sustainable intensification, or increasing the yield per unit of land to meet today’s needs without exceeding current resources or reducing the resources needed for the future, should be a primary goal.

While the REDD+ process needs to address agriculture as a driver of deforestation, a recent analysis of country REDD+ readiness proposals shows that most countries do not yet have concrete plans for addressing agricultural drivers of deforestation or the food security implications of REDD+. Although countries acknowledged the importance of agriculture as a driver of deforestation, their proposed strategies and actions were very general. More tangible, detailed measures that build on existing efforts and are calibrated to local conditions will be necessary to better manage agricultural drivers (Kissinger 2011).

Food security and Poverty Alleviation Imperatives
Despite increased food production in the last half-decade, 925 million people were hungry in 2010 according to the Food and Agriculture Organization (FAO) of the United Nations. Addressing issues of inequitable and poor distribution of food, as well as improvements in storage and processing can go a long way towards helping to extend food security. However, food needs are also projected to increase by 70–100% by 2050 when the global population reaches 9 billion. Scenarios to 2050 suggest that improved agricultural productivity, as part of a strategy for widely distributed economic growth, will be important to offset the negative effects of climate change on food security (Nelson et al. 2010). Agriculture will need to be adapted to future climate change and contribute to climate change mitigation, i.e., be ‘climate smart.’

Climate-smart agriculture seeks to maximize synergies and minimize trade-offs in addressing food security, development and climate change adaptation/mitigation challenges.

Managing The Agricultural Frontier
Past efforts to protect forests by managing the advance of the agricultural frontier suggest that managing the porous forest-farm interface depends on a mix of institutional, market, technological and demographic factors.

Institutions related to land tenure, zoning of land, forest governance and enforcement of forest boundaries are critical. Forest conservation and livelihoods have been improved
most often where enforcement of forest boundaries was strong (Agrawal et al. 2011).

Producing more crops from less land is a significant means of jointly achieving mitigation and food production in agriculture, assuming that the resulting spared land sequesters more carbon or emits fewer greenhouse gases than farmland. However, intensification often leads to local expansion of agriculture if increased demand for production is possible and labour is available (Angelsen 2010). Intensification therefore needs to be linked to policies and price incentives to strengthen its impacts on land sparing (Angelsen and Kaimowitz 2000).

Intensifying agriculture through the use of higher inputs can also lead to higher total emissions in the long run (in the atmosphere and per hectare) due to, for example, increased use of fertilizers, water, energy use or animal feed. Agricultural improvements that are climate smart (minimize impacts on the climate and adaptive to future climates) while also maintaining or intensifying production are a priority. Approaches to increase organic matter in the soil and aboveground biomass (e.g. agroforestry) should be explored further for their potential for delivering food security, adaptation to climate change and mitigation of climate change (FAO 2010).

**Policy Implications**

How can we stop deforestation, so as to maximize mitigation outcomes from REDD+ while also enhancing food security under a changing climate? Five policy actions can help achieve positive outcomes for forest-agriculture landscapes and countries. They require early action to build experience for widespread implementation. The five priority actions are:

1. **Develop strategies to better integrate REDD+ and sustainable agricultural development.** Integrated action is needed across REDD+ and agriculture to achieve both mitigation and food security (Rudel et al. 2009; Seymour and Angelsen 2009). An AFOLU approach will not only guard against leakage, but also enable applying criteria for multiple desirable outcomes across both forestry and agriculture to guide policy and projects on the ground. National agricultural development policies and REDD+ will need to be aligned within broader low-carbon development strategies and comprehensive climate change action plans at the national level (Meridian Institute 2011).

2. **Identify and implement incentives for ‘climate-smart’ agriculture.** REDD+ funding, as well as climate finance, more broadly, and financing for agricultural development (for example, farm credit, input subsidies, extension), can be used to provide incentives for climate-smart agriculture that don’t undermine forest conservation. In some cases these could be appropriately directed towards covering the opportunity costs of farmers that protect farm forests or participate in community-based forest conservation (including through fire prevention and management), while in other cases they may provide the extra incentives for farmers to switch to technologies and practices that are more climate-smart but which have, for example, higher up-front costs, such as planting trees for agroforestry (Negra and Wollenberg 2011).

3. **Disseminate existing knowledge regarding the role of forests in supporting food security and sustainable agricultural production, and invest in further research to illuminate synergies and trade-offs.** Forest protection is often presented as an impediment to agriculture and food security, when in fact forests provide a largely hidden source of income and employment to rural communities, as well as ecosystem services necessary for sustainable agricultural production.

4. **Enhance forest governance and institutional arrangements for forest conservation.** A range of sound governance arrangements will be needed if REDD+ is to be successful (Angelsen et al. 2009). These include new institutions to implement payment mechanisms linked to monitoring, reporting, and verification (MRV) systems for achieving mitigation targets; improved practices to minimize opportunities for corruption in new revenue flows; and optimal decentralization of decision making.

5. **Substantially increase the finance available to meet the climate change and food security challenges faced by the agriculture sector.** FAO has argued that sustainable transformation of the agriculture sector, necessitating combined action on food security, development and climate change, will be costly and will require large-scale investments to meet these projected costs (FAO 2010). Uncertainties about potential losses, catastrophic risks and increased costs of inaction associated with climate change indicate that immediate and more aggressive transformative action is needed. Financing is thus urgent. They have argued that the available financing, current and projected, is substantially insufficient to meet the challenges faced by the agriculture sector. Synergistically combining financing from public and private sources, as well as those earmarked for climate change and food security, are innovative options to meet the investment requirements of the agricultural sector.

The above actions represent a portfolio approach. It is crucial that all these actions be effective. Together they should have synergistic effects. Agricultural intensification solely for the purpose of food production, or protection of forests solely for the purpose of climate change mitigation, will not create sustainable forest-agriculture landscapes.
Conclusions

Mechanisms for forest protection and improved agricultural practices will require close coordination. Meeting future food needs will require developing approaches to climate-smart agriculture that best suit the needs of diverse farmers in different places.

Sustainable intensification of agriculture (the increase of yields per unit of land or other input) will be one strategy for producing more food in places where land is limited. The role of forests in supporting such intensification should be recognized and further clarified.

For intensification to reduce conversion of carbon-rich forests, strong institutional measures will be needed, especially for enforcement of forest boundaries. Intensified agriculture will also have to be more resilient to climate change, and reduce its impacts on climate change and the environment. Perennial and intensified annual-crop agriculture that adopts sustainable agricultural land-management approaches may be able to sequester significant amounts of carbon in the soil and above-ground biomass.

National agricultural development policies and REDD+ must be aligned within broader low-carbon development pathways and comprehensive climate change action plans at the national level to avoid spiraling incentives for undesirable land use, as well as manage opportunity costs for REDD+. A combination of governance arrangements with both positive incentives and regulations and sanctions is required. A sound science base is necessary to improve the array of climate-smart technologies and practices currently available, and to identify appropriate incentives for achieving the triple wins of food security, adaptation and mitigation. Major new financial resources will be needed to transform the agricultural sector.

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CCAFS
The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a 10-year research initiative launched by the Consultative Group on International Agricultural Research (CGIAR) and the Earth System Science Partnership (ESSP). CCAFS seeks to overcome the threats to agriculture and food security in a changing climate, exploring new ways of helping vulnerable rural communities adjust to global changes in climate.
Voluntary markets and other global developments

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Carbon Valuation - Managing Volume & Price Uncertainty
Jonathan Grant, PwC Carbon Markets Team

Policy Uncertainty And The Balance Sheet
Understanding policy and project uncertainty has always been a key part of valuing carbon portfolios. When considering their balance sheets, many fund managers are asking what the CDM will look like post-2012 and whether the EU will tinker with eligibility restrictions on particular technologies and geographies. Decisions by the CDM Executive Board (EB) and the European Commission affect the willingness of investors to develop new projects, as well as the value of carbon contracts. A carbon fund hit the headlines late last year after it cut the expected delivery of credits from its portfolio of purchase contracts by 25%.

International Accounting Standard (IAS) 39 provides rules for the treatment of financial instruments such as forward contracts to buy or sell CERs or EU Allowances (EUAs). If a company’s carbon contracts were entered into, and continue to be held, for the delivery of allowances to meet their own compliance requirements, they must apply the ‘own use’ exception for these forward contracts. The ‘own use’ exception results in these forward contracts being accounted for as executory contracts rather than derivatives. However, contracts which fall outside the ‘own use’ exception (such as those entered into by investment banks, carbon funds and some compliance players who actively trade carbon), must be treated as derivatives and held at fair value through profit and loss.

At the most basic level, the key variables in valuing a contract to buy primary CERs from a CDM project are price, volume and timing.

Is The Price Right?
IAS 39 states that the best evidence of fair value is a quoted price in an active market; in this case a business should mark to market. A year ago, there was no forward price for secondary CERs post-2012 because of the lack of clarity around the regulatory regime for those carbon credits. In the absence of a quoted price, portfolio managers can use a number of alternative valuation techniques under IAS 39. These include reference to recent arms’ length transactions between knowledgeable, willing parties if available, discounted cash flow analysis and option pricing models.

Without much publicly available information about prices for post-2012 secondary CERs, some referred to the annual World Bank ‘State and Trends of the Carbon Market’ report. This notes prices in the range of €6-8. However, now that the EU has clarified the eligibility status of CERs, there is a forward price curve quoted on exchanges which extends beyond 2012. Companies can now refer to exchange quoted prices for 2013 and 2014 vintage CERs. However, with low volumes traded for 2014 CERs, reverting to the original approach of referring to market reports, such as the World Bank’s, is acceptable.

There is also the challenge of pricing CERs from industrial gas projects post-2012 (or more specifically after 30th April 2013) – what discount should be applied. There is still quite some variability in the discount suggested by different analysts for these ‘grey CERs’, some suggesting up to 10 Euros less than a green CER. Recently, the Australian government has proposed carbon regulation which, like Europe, would exclude grey CERs, so perhaps the only remaining buyers are Japanese, meaning that a comparable price could be derived from reported AAU transactions.

The concern is that the imposition of eligibility rules affecting particular geographies or technologies will further fragment the market. With less fungibility between markets in the EU, California, New Zealand and elsewhere, pricing CERs will become more complex.

How Much, And When?
The other key variables in the valuation equation are volume and timing. Buyers of non-guaranteed primary CERs will typically quantify a number of risks to estimate the delivered volume they expect from a specific project. While these risk adjustment methodologies may vary, they typically include technology, regulatory and project implementation factors. We consider a number of issues when reviewing a carbon portfolio:

- Risk adjustment factors – is there reference to external benchmarks (such as UNEP Risoe); how is project-specific performance addressed in the model (when a project is operational)?
- Relationship and interaction with project developer – how frequent is the interaction between the buyer and project developer; are causes of delays understood, addressed and incorporated in the model?
Governance and controls – how is the portfolio valuation model managed, updated, reviewed and approved; how are duties segregated; how is access to the model restricted?

Contractual terms – are there other buyers from the same project; are there pre-payments or investment in equity; is the price fixed or floating?

Installations in the EU ETS have until 30 April 2013 to surrender credits for Phase II of the scheme. For the 20 largest CER issuance requests, the average time lag between the end of a project monitoring period and issuance is over nine months. This suggests that for industrial gas projects (which face eligibility restrictions at the end of Phase II), only activity up to July 2012 could be monitored and issued prior to the end of April 2013. Buyers may therefore need to further discount their risk-adjusted volumes for 2012 to account for these delays and it remains to be seen whether these time lags get worse as we approach this crucial cut-off point.

The demand and supply uncertainty could have a material impact on the future value of CERs in a portfolio, and therefore the volume and price assumptions currently used may not be appropriate. Businesses with portfolios of forward contracts for CERs therefore need to monitor decisions and actions of the European Commission and the CDM EB and revalue their forward contracts accordingly.

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A Carbon Standards Overview
Robert Vergnes, ERM

Climate change is a key issue for our society and many governments are strengthening their policies to preserve the environment.

In this context, companies that want to grow and to manage their environmental risks can now refer to some established standards allowing them to assess and report their environmental indicators and have their approach certified.

Done in that way, environmental reporting becomes a real asset to improve and develop a companies’ products, to reduce the industrial risks, to supply the capital market with environmental reporting — notably with ethical data — and provide the basis for communication and marketing actions while avoiding any “Green washing” suspicion.

Why Use Standards for Voluntary Reporting?
Companies must be able to understand and manage their environmental risks in order to ensure long-term success in a competitive business environment and to benefit from Green Claims.

A well-designed, maintained and certified corporate GHG inventory, product carbon footprints, and/or carbon neutrality process can serve several business goals:

- Managing GHG risks within supply chain
- Implementing product development policies and eco-design.
- Identifying GHG reduction opportunities and improving production efficiency
- Participating in social & sustainable actions
- Participating in GHG markets (mandatory and/or voluntary)
- Making financial indexes through Environmental declarations (e.g. by fulfilling the Dow Jones Sustainable index, Carbon Disclosure Project and/or the Global Reporting Initiative requirements)

Reminder on some specific standards:

ISO 14040/44: 2006 – Life Cycle Assessment (LCA)
A life cycle assessment (LCA, also known as cradle-to-grave analysis) is the evaluation of the environmental impacts of a given product or service caused or necessitated by its existence. Assessed impacts can be global warming, acidification, depletion of minerals and fossil fuels, water use, etc.

The ISO 14040 standard describes the principles and framework of LCA whereas ISO 14044 specifies the requirements and provides guidelines for performing an LCA with its 4 phases:
- The Goal and Scope definition,
- The life cycle inventory (LCI) analysis phase,
- The life cycle impact assessment (LCIA) phase,
- The life cycle interpretation phase.

PAS 2050: 2009 – How to Assess The Carbon Footprint of Goods And Services
PAS 2050 is a Publicly Available Specification (PAS) prepared by the British Standards for assessing greenhouse gases (GHG) emissions of a product, either a good or a service, across its entire life cycle – from raw materials through all stages of production (or service provision), distribution, use and disposal/recycling. It differs from LCA because it covers only GHG emissions. PAS2050 through streamlining makes the analysis process easier than conducting an LCA.

1 Standard ISO14000 = Standard for environmental improvement and management. This article does not deal with EN16000 Standard = Energy Standards.
GHG Protocol 2000/2006 – Corporate Accounting and Reporting Standard

The GHG Protocol deals with activities and consists of two separate but linked standards:

- The GHG Protocol Corporate Accounting and Reporting Standard that provides a step-by-step guide for companies to use in quantifying and reporting the GHG emissions of their activities.

- The GHG Protocol for Project Accounting and Guidelines that is geared toward calculating reductions in GHG emissions from specific GHG-reduction projects.

In 2006, the International Organization for Standardization adopted the Corporate Standard as the basis for its ISO 14064-1 and the Project Protocol as the basis for its ISO 14064-2.

PAS 2060: 2010 – Specification for the demonstration of Carbon Neutrality

PAS 2060 is a Publicly Available Specification (PAS) prepared by the British Standards that sets out requirements to be met by any entity (e.g. government, companies…), products or services which seeks to demonstrate carbon neutrality through:

- The quantification of carbon missions using verifiable standards (PAS2050, GHG Protocol etc…)

- The reduction of emissions via identified internal actions

- The offsetting of remaining GHG emissions using market mechanisms – i.e. purchase of reputable carbon credits (CDM/JI/EUA)

The boundary and subject must be clearly defined. There are no limits as to the subject it can be an activity, a product, a service, a city, etc. The PAS2060 also sets out different types
of claims that can be made by the company (i.e. neutrality to be achieved, neutrality achieved, verified, etc…)

Development Strategy: ERM Carbon Pyramid
This pyramid illustrates the steps to be followed in order to start and achieve a complete carbon certification and indicates the various standards associated to the process. It is to be noticed that different standards are to be followed in case of a product or an activity. The convergence of the “activity” and “product” standards is in the pipeline for 2012.

BPX30-323 – Environmental Labeling
BPX30-323 is a repository developed by ADEME (The French Environment and Energy Management Agency) that establishes rules and good practices for environmental claims on consumer products. It defines relevant indicators and methods to calculate them (taking into account the products’ entire life cycle). CO2 emissions is the only common indicator; other indicators will be developed according to product categories, for example, toxicity for a detergent, or scarcity of the resource for fish.

Evolution of New Standards
The ISO 14067 standard is currently under development. It is in 2 parts: the first part addresses the quantification of the carbon footprint of products; and the second part provide guidance for communication on this carbon footprints.

Furthermore, following the success of the previous ones, the WRI and WBCSD are developing two new GHG Protocol standards for products and scope 3:

- The Product Life Cycle Accounting and Reporting Standard that will provide a standardized method to inventory the emissions associated with individual products across their whole life cycles.

- The Scope 3 Accounting and Reporting Standard that will provide a method for an inventory of the emissions from the whole supply chain.

Other initiatives that are ongoing among are the “Integrated Reporting” and the WBSCD Environmental Impact accounting Valuation Guide.

Implementation
As the GHG Protocol is the most widely used international accounting tool to quantify GHG emissions, the first step is to appraise Scope 1 & 2 so as to provide an overview and deliver objectives for the company.

Indirect emissions from the value chain (upstream and downstream of the business) are typically significant emission sources for most companies and are subject to particular interest from stakeholders. Indirect emissions are therefore logical next steps for appraisal using the GHG protocol scope 3 Accounting and Reporting Standard. To go further, companies can go through carbon footprinting and labeling of their products, complying with methods such as PAS2050.

By following accepted standards companies will be able to look to delivering Carbon Neutrality for their products or activities, by reporting improvements and offsetting the remaining emissions with high quality carbon credits from the market.

PAS2060 prescribes a complete carbon certification approach to bring Carbon Neutrality for activities or products. Employing such approaches, the company will be able to communicate efficiently to its stakeholders and/ or clients due to rigorous reporting and strong “green claims”.

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Free Allowances: A Response Measure with the Potential to Affect Sustainable Development Through Trade
Ingrid Jegou, ICTSD (International Centre for Trade and Sustainable Development)

Scientific reports, combined with increasingly erratic weather, all point to the fact that climate change is quickly becoming a reality. As a response, countries are drafting and implementing policies to mitigate and adapt to climate change, although to what extent depends on their own particular awareness of and vulnerability to the effects of climate change, as well as their individual capacity and political will to address it. On the option of international cooperative action in the form of contractual multilateralism, difficult negotiations are taking place within the framework of the United Nations Framework Convention on Climate Change (UNFCCC) with deplorably slow progress.

In the absence of a comprehensive and binding global common regime to best address climate change, the world is facing a situation where a broad range of tools, and variations of these tools, get used with growing frequency. Resulting action is often uneven: some countries are putting in place comprehensive policies to address mitigation as well as adaptation; others are doing their best to adapt with already scarce resources; still others are, at best, just beginning discussions on what or whether to do.

In this landscape of scattered climate action, developing countries are particularly concerned that the measures put in place to mitigate climate change may affect their own opportunities for social and economic development. For a long time, these so-called “response measures” were discussed under different tracks within the UNFCCC; however, at the December 2010 Conference of the Parties (COP) in Cancun, one of the concrete outcomes was to consider consolidating these discussions into a set forum.

Many developing countries especially advocate such a forum, as without one they find it difficult to get a good overview of the measures taken by industrial countries and to assess their possible impact.

Among the mitigation measures that could be discussed in this type of forum is the practice of allocating emissions allowances free of charge within an emission trading scheme (ETS). Depending on the measures design, there is the risk that free allowances could subsidise producers in the economy covered by the ETS, strengthening in turn their competitive position relative to foreign producers, including in developing countries.

Emissions Trading Schemes And Free Allowances

As a part of their attempts to reduce greenhouse gas emissions, a number of countries are putting in place ETSs. Such schemes generally take the form of cap-and-trade systems, which consist of caps for total emissions from covered sectors; rights or “allowances” to emit greenhouse gases; and a market for trading allowances. Cap-and-trade systems are considered to be cost-effective: emission reductions can be undertaken where abatement costs are relatively low, whereas industries with less favourable abatement opportunities can buy additional allowances on the market.

However concerns remain that in cases where these systems are imposed unilaterally, the carbon cost under this system could alter the competitive position of a country’s domestic industry; the affected industry would therefore risk losing market shares to competitors in less restrained economies. As a result, industries that are affected could just choose to move their production abroad to these less restrained economies – and thus move the emissions abroad with it – rather than abating the emissions in absolute terms. This scenario is commonly referred to as carbon leakage.

Policymakers have a number of available options for addressing carbon leakage concerns. One commonly used tool in existing and proposed ETSs is to allocate all or some of the emissions allowances for free to individual firms, as opposed to selling them for instance under an auction. Such free allowances would be targeted at sectors sensitive to carbon leakage, in particular sectors heavily exposed to trade that would face considerable cost increases due to the ETS. The firms would thus be covered by the system and be required to hold emissions allowances to account for their emissions, while being relieved of the direct cost of purchasing the allowance. However, even free allowances constitute a constraint for firms.


2 Decision 1.CP/16, “The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention”
covered by the scheme. By actually making use of the allowance, firms lose the opportunity to sell that same allowance for profit, which is something they could do if they were able to abate parts of their emissions. Therefore, at least theoretically, firms receiving free allowances would have an incentive to curb their greenhouse gas emissions.

**Subsidy Elements May Distort Trade And Affect Sustainable Development**

At first glance, free allocations generally appear less provocative than border taxes from a trade perspective and so far generate substantially less debate among policy makers and industry in countries on the receiving end. Indeed, an additional carbon cost on their exports is a measure that is visible and noticeable, and therefore likely perceived as more disturbing than a possible subsidy to their competitors, which is difficult to assess and the effects of which are hard to estimate. As we shall see below, third countries do however have reason to be vigilant. Indeed, depending on the design of the ETS and the mode of allocating the emissions, free allowances risk providing extra advantages or acting as subsidies to some firms within the ETS, beyond compensating them for the carbon cost. Such firms may then find themselves in a stronger financial situation, with an improved competitive position relative to foreign firms.

The effects of subsidies, such as potentially boosted exports and/or lower prices, could be felt by all firms operating in the world market. In other words, it would not be possible to provide exceptions or more favourable treatment to developing country actors in recognition of the UNFCCC core principle of “common but differentiated responsibilities” or the WTO-practice of “special and differential treatment”, nor would it be possible to specifically target polluting firms or countries without a carbon cost. This can be compared with border measures, which could through design be targeted at a few countries. As trade is a critical driver of growth, and thus sustainable development, measures hampering free trade may therefore negatively affect development prospects.

In addition to free allowances creating wealth within the firm, there are other elements of potential subsidies in free allocation. First, there is a risk of over-compensation. This can happen either when firms are allocated more allowances than they would need to account for their emissions, or when firms receive free allowances despite already being able to recoup the carbon cost from consumers. In the case of over-compensation, “windfall profits” occur – a situation that has already emerged in the case of the EU-ETS, in particular with the power sector.

Second, depending on how new entrants on the market are treated under the scheme, there is potentially the scope for these free allowances to act as an investment subsidy. Giving free allowances in proportion to the energy intensity of a firm’s production processes can bias incentives towards more carbon-intensive investments. A lack of harmonisation among countries with respect to new entrants can create further distortions. Research shows that within the EU, free allocations to a new natural gas combined-cycle plant would vary from zero allowances in Sweden to allowances worth as much as EUR 11 million in Germany, at a carbon price of 10 EUR/tonne.³

Third, these allowances can potentially serve as a production subsidy, i.e. with regard to firms’ plant closures. If free allowances are withdrawn in the case of a plant closure, then inefficient plants are given an incentive to stay open and avoid losing their free allowance. If exiting operators would be allowed to keep the entitlement to the free allowances, this risk could be avoided. Finally, if sectors are not treated the same within an ETS - as has been the case in the EU-ETS, where there have been differences in implementation between member countries - firms in one country may find themselves in a stronger competitive situation than their counterparts in other countries. This can clearly affect competition between those firms, despite all falling under the umbrella of the same emissions trading scheme. Further research will be necessary in order to examine if and how such distortions could affect trade with developing countries.

To sum up, there are several ways in which free allowances could turn into subsidies. Looking at the evidence, research has focused in particular on the presence of windfall profits, and has been able to establish such profits in particular in the power sector, but also on a broader scope of sectors.⁴ Taking the analysis one step further, and establishing possible consequences on trade, is however difficult. Indeed, at this point our understanding of decisions on a firm level is not yet very sophisticated and therefore challenging to quantify. Evidence of displacements of trade may therefore be necessary to demonstrate at a case-by-case basis.

Many of the possible adverse effects related to free allowances can be avoided if the scheme is well designed. The EU for instance has drawn important lessons from the first phases of its ETS, and is making considerable improvements in the third phase. The importance of the design of the scheme un-


derlines the above-mentioned need for vigilance among trading partners, and monitoring of schemes being set up around the world. It does however also mean that considerable resources are required; as one ETS is not like another, trading partners would need to understand the detail of the different schemes. This can be challenging in particular for developing countries with limited capacity.

**Free Allowances May Challenge International Trade Rules**

The WTO regulates international trade; given that free allowances could impact trade, these measures would therefore be subject to the global trade body’s rules. The WTO Agreement on Subsidies and Countervailing Measures (SCM) specifically deals with matters relating to subsidies, making it the logical starting point of a legal analysis of free allowances.

Article 1 of the SCM defines what qualifies as a subsidy. A subsidy is deemed to exist if there is

1. A financial contribution by a government (e.g. revenue that is otherwise due is foregone or a government provides goods or services)
   or
2. If there is any form of governmental income or price support liable to impact trade and
3. If a benefit is thereby conferred.

Forthcoming analysis by ICTSD\(^4\) shows that the free allocation of allowances may indeed include elements of government support. In fact, free allowances can be said to involve governments foregoing revenue from these firms that would otherwise have been due. These allowances could also be seen as being government-provided goods or services (which are both forms of a financial contribution), or a form of income support.

The analysis then shifts to establishing whether free allowances may confer a benefit, i.e. by recipient firms not being required to pay what they should, whether that payment is a price, a tax, or compensation for environmental damage. This analysis is complex and depends on various factors. One of these is how to establish the relevant benchmark.

The following step of the examination is to consider whether the still unclear economic impacts of free allowances effectively constitute adverse effects and injury to the interests of other countries, in which case the legal test would be met, ultimately rendering the subsidy objectionable. As indicated above, the empirical evidence of the economic effects of free allowances on international trade and competition is still thin, particularly in regards to the long term. Any definitive legal assessment under the various tests of serious prejudice, nullification and impairment of benefits and injury, can only be carried out on a case-by-case basis, and after an empirical investigation has been performed. The novelty of free allowances as a policy tool makes analysis challenging.

For example, it might be necessary to assess if a subsidy is also specific. In order for a subsidy to be subject to WTO scrutiny, it needs to be specific “to an enterprises or industry or group of enterprises or industries” (Article 2 SCM). Because mainly certain energy-intensive industries benefit from the free allocation, it can be concluded that, if this measure amounts to a subsidy, the free allocation of allowances would also be specific under Article 2 of the SCM Agreement.

The conclusion that the free allocation of allowances may, under certain conditions, constitute an objectionable subsidy under WTO law does not constitute the end of the legal analysis. The public policy objectives that are put forward in support of free allocation – mainly the avoidance of carbon leakage concerns, integral to combating climate change, which lead to enquire the existence or desirability of a legal justification for using this measure.

The SCM Agreement does not provide any direct basis for legal justification of free allowances. The attention therefore shifts to a legal question of huge systemic relevance: the applicability of the general exceptions of Article XX of the General Agreement on Tariffs and Trade (GATT) to subsidies adopted to fight climate change, in this case free allowances. Paragraph (b) of Article XX GATT allows for making exceptions form the general rules if “necessary to protect human, animal or plant life or health” and paragraph (g) for measures “relating to the conservation of exhaustible natural resources”. The issue is still unresolved and is becoming increasingly topical; the case law to date has yet to provide clear and unequivocal indications on this subject. However, an analysis of this legal issue, and more particularly, of the exceptions under paragraphs (b) and (g) under the chapeau of Article XX, suggests that this provison may well apply to subsidies.

**Design Matters: Developing “Best Practices”**

The possibility of the above-mentioned free allowances impacting on trade depends, to a large extent, on the design of these measures. For instance, the type of cap and the type of emissions targets has an effect, as does the method for determining the amount of allowances to distribute for free. We have also seen that treatment of new entrants and firms exiting the market play a role.

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\(^4\)Jegou, Ingrid; and Luca Rubini; (2011); The Allocation of Emission Allowances Free of Charge; Legal and Economic Considerations; ICTSD Programme on Competitiveness and Sustainable Development; Transition to a Low Carbon Future Series; Issue Paper No.18; International Centre for Trade and Sustainable Development, Geneva, Switzerland, www.ictsd.org.
Voluntary markets and other global developments

The outcome of the legal analysis outlined above, both per se and linked to the economic impact of the allowances, also depends to a high extent on the design of the measures.

In light of this fact, and considering the wide use of emissions trading schemes and free allowances, more empirical analysis needs to be featured into international climate and trade negotiations. Developing a set of guiding principles or “best practices” for emissions trading schemes and the use of free allowances is a step worth considering. Doing so could help ensure that efforts to address climate change are efficient and effective, while minimising the possible adverse effects of these measures, particularly on the social and economic development of developing countries.

Need For Forum To Discuss Trade-related Response Measures

In the meantime, it would be useful to have a forum for discussing the issue of free allowances, as well as other response measures that may have a particular impact on the social and economic development of developing countries through trade. Indeed, several response measures - such as climate labelling, taxation of international transport, or border carbon adjustment measures - are likely to have an impact on trade, and consequently on global development opportunities.

Currently, there is no multilateral forum for discussing trade and climate change linkages. The WTO has for a long time referred to the UNFCCC as the competent body for dealing with this subject and many trade negotiators have repeatedly resisted bringing new issues to the table that might divert attention away from the difficult trade negotiations in the framework of the Doha Development Round. Negotiations in the UNFCCC have similarly avoided engaging in conceptual discussions about trade. Nevertheless, ignoring the linkages does not make them go away. On the contrary, a worst case scenario could see countries avoiding effective climate action due to this lack of clarity, or lead to countries engaging in retaliatory strategies and difficult trade disputes.

The proposed forum in the UNFCCC could, if Parties agreed to it, provide a space for discussing some of these trade-related response measures, which would in turn provide a better overview and understanding of this complicated subject. Such a discussion should aim to facilitate the implementation of effective measures to address climate change, while avoiding adverse effects on sustainable development.

Some of the possible outcomes of this forum might include identification and referral to the appropriate rule-making processes of matters related to multilateral governance of both trade and climate change policies, ensuring that both allow for the optimisation of global sustainable development opportunities. This would likely be insufficient for addressing the various challenges that arise for trade in relation to climate change - but it would nevertheless be an important first step.

Ingrid Jegou is the Manager of the Global Platform on Climate Change, Trade and Sustainable Energy, a cross-cutting initiative within ICTSD.

The International centre for Trade and Sustainable Development, ICTSD, is an independent, non-profit, and non-governmental organization that aims to influence the international trade system such that it advances the goal of sustainable development. ICTSD engages a broad range of actors in ongoing dialogue on trade and sustainable development policy. In advancing its mission, the Centre has become a leading broker of knowledge and information on trade policy and sustainable development.
Current Programmes of Activities (PoA) situation

The Programmatic Clean Development Mechanism began with a slow start, with only 28 Programmes of Activities (PoAs) being submitted by November 2009 – a full two years after the Clean Development Mechanism Executive Board approved the official PoA Document Design templates. However, the number of PoAs that were submitted between January and July 2011 rose to 38, with an average of 5 per month and a spike of 12 PoAs submitted in July. This is good news, especially for Africa as 24% of the PoAs in the pipeline are located within the continent, in contrast to only 2.6% of the overall CDM projects.

However, while there has been an increase in the number of African PoAs requesting validation, only one PoA has actually been registered in Africa. After years of being a region where very few CDM projects have happened, more can be done in order to encourage PoAs in Africa, particularly in Least Developed Countries (LDCs).

Rwanda DNA on PoAs

Rwanda is a LDC that until recently only benefited from the CDM through one project: the Rwanda Electrogaz Compact Fluorescent Lamp (CFL) Distribution Project, registered on 30 May 2010. With the help of a reinforced and motivated Designated National Authority (DNA), Rwanda now appears to be on a trajectory of generating an increased number of carbon credits within the country.

There are now three registered projects (the above mentioned CFL project and two small scale solar UV water purification projects registered by Manna Energy) in Rwanda. Two other projects are in validation, one lighting project (Nuru Energy Lighting Project in which lights which are charged by human pedaling) and one PoA (Improved Cookstove Programme for Rwanda with Atmosfair gGmbH and Enedom), with other projects, such as another Rwanda improved cookstove PoA soon to be submitted to validation. Furthermore, Rwanda is set to be included in a number of East Africa PoAs, including the Improved Cookstove for East Africa Project (ICSEA) (Uganda Carbon Bureau) which is in validation.

Mr. Jean Ntazinda is the head of the DNA Secretariat and has been an integral part of promoting CDM in Rwanda. Mr. Ntazinda has been part of the DNA Secretariat since September 2009, when the United Nations Development Programme (UNDP), and later the United Nations Environment Programme Risoe (UNEP – Risoe), began funding CDM capacity reinforcement projects in Rwanda. Mr. Ntazinda discusses here about PoAs in Rwanda and elsewhere.

"The Rwandan DNA has actively been trying to encourage the development of PoAs, with both international and national coordinating entities (CEs). We [the Rwanda DNA] receive numerous project developer visitors who are considering projects of similar technologies, particularly, improved cookstove projects. We put developers working on similar technologies in contact with each other in hopes that they will join together in a PoA. For local project developers, who often have smaller projects, we work very hard to try and encourage them to work together. They support the idea but there are sometimes cultural barriers as some people here are not used to collaborating with others for business ventures.

We conduct many trainings on the carbon market and include a session on PoAs – what the benefits are, how PoAs differ from CDM project activities, and how PoAs are implemented. We provide these trainings to private sector members, financial institution members and government officials. We also very regularly, sometimes on a weekly basis, update our website which includes information about current and upcoming PoAs in Rwanda.

Finally, we are planning to conduct a feasibility study of a PoA for the Ministry of Education which hopes to install institutional biogas digesters at secondary schools throughout the country. We would like to begin this project as a PoA and, hopefully, in the future convert it into a Nationally Appropriate Mitigation Action (NAMA).

We think that there are many benefits of PoAs: they typically have high sustainable development benefits, which are very important for Rwanda; they encourage technology transfer on a large scale; and they allow for a wider scope of technologies than a typical CDM project. However, there still are many challenges of PoAs. For one, especially for local project developers, it’s very difficult to agree on a coordinating entity that is willing to take on all of the responsibilities of the project; these responsibilities will include ensuring new CPAs meet the established criteria, maintaining records of monitoring information about
all of the CPAs, assisting CPAs with monitoring, organizing verifications and distributing issued CERs. Monitoring and verification is also still a challenge as many Designated Operational Entities (DOEs) require site visits or high fees for the inclusion of every CDM Programme Activity (CPA) and this is costly and time consuming. Also, for multi-country PoAs, there is the general challenge of getting Letters of Approval (LoAs) from every DNA which is part of the PoA; getting all the LoAs may take months or years.

Finally, I think there are a number of things which could be done to encourage PoAs. I think that some capacity building funding should go directly into funding demonstration PoAs in countries, especially ones with local project developers. Success with one PoA will encourage many others. Also, as is often the case in Africa, PoA developers in Rwanda face the challenge of receiving loans from financial institutions. Assistance with access to credit would be useful and this could be tied into funding demonstration projects. In conclusion, I also think there should be more standardized validations and verifications for CPAs, in order to keep down costs and reduce time spent.”

PoAs & Technology Innovation

One interesting consequence of the augmentation of PoAs in the CDM is the change in the type of technology used in PoAs, compared to the technology typical to CDM projects. The three largest PoA and CDM sector types and percentage of the total composition are in below table:

<table>
<thead>
<tr>
<th>PoA main technology type and percentage</th>
<th>CDM project main technology type and percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand side energy efficiency (36.7%)</td>
<td>Renewables (63%)</td>
</tr>
<tr>
<td>Waste (24.8%)</td>
<td>CH4 reduction and Cement &amp; coal mine bed (18%)</td>
</tr>
<tr>
<td>Solar (13.8%)</td>
<td>Supply side energy efficiency (9%)</td>
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</tbody>
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The difference in technology types is due largely to the fact that PoAs facilitate technologies that generate a small number of carbon credits on a per-unit basis. This is likely to help encourage innovation for technologies that reduce emissions on a small scale.

One example of the dissemination of a new technology due to PoAs is the application of the Save80 improved cookstove under the atmosfair gGmbH PoA. The Save80 cookstove is an innovative ‘second generation’ improved cookstove. The design ensures the air is preheated and the stove burns with complete combustion. There are now Save80 cookstove PoAs in Rwanda and Nigeria.

The Nigerian PoA is of particular interest because the project began as a small scale CDM project, not a PoA, due to the lack of PoA framework at the time. However, as PoA procedures were developed, the project developer (atmosfair gGmbH) decided to upgrade the second phase of the project to a PoA. In addition to having an innovative cookstove design, the product is constantly evolving. For instance, in the Rwanda project, the local partner (Enedom) who is retailing the stove has made recommendations to the designer to adjust the stove for the local situation; this has been done without decreasing the efficiency of the stove.

Another sector that has recently gained much attention is that of water purification. The first two registered water purification projects, the solar powered ultraviolet water purification projects by Manna Energy in Rwanda were not PoAs but there are now many water purification PoAs applying innovative and varied technologies. In Tanzania, the Solarwave water purification PoA which is being completed by Tricorona Carbon Asset Management is in validation.

Likewise, in Uganda, the International Water Purification PoA is being undertaken by the Swiss Federal Institute of Aquatic Science and Technology, with assistance from South Pole Carbon Asset Management; this PoA is also in validation.

Without the existence of programmatic CDM, due to the very small per-unit emissions, these types of projects - with innovative technologies which contribute greatly to sustainable development, particularly in Africa - would not have been possible, as the CDM transaction costs would be too high to make the projects economically viable.

For instance, in Rwanda, which is a small country with a limited number of entrepreneurs, there are currently one Rwanda specific improved cookstove (ICS) PoA in validation, one East Africa ICS PoA in validation and another Rwanda specific improved cookstove PoA soon to be submitted for validation. In addition to this, there are a number of other developers interested in beginning their own improved cookstove PoAs. It is not expected that having numerous ICS PoAs in Rwanda will be very problematic. However, having multiple

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3Second generation improved cookstoves typically are more durable, more expensive, more technologically advanced and more efficient than first generation improved cookstoves

4Manna Energy considered registered the project as a PoA but, due to the challenges of PoAs that were clearly present in September 2009, when the projects were submitted to validation, the projects were done as small scale CDM projects.
PoAs of the same type in the same small country does not seem to be the most efficient use of the mechanism and there may be some confusion amongst local entrepreneurs about which PoA they should join. Once there is a registered PoA in Rwanda under which numerous CPAs have joined, hopefully this situation will be ameliorated. However, I imagine it will be an issue in most, if not all, countries until PoAs are better established and understood.

**Conclusion**

The improvement in the procedures for Programmes of Activities is one of the key factors leading to a significant increase in the number of PoAs in the pipeline. The application of programmatic CDM is particularly significant because it is leading to an increase in the number of projects in Africa, a continent that has yet to reap full benefits from the CDM.

Projects in least developed countries are also gaining more importance as the end of the Kyoto Protocol nears and, with it, the end of Phase II of the European Emissions Trading Scheme; in Phase III, the European Union has declared that the trading scheme will only allow credits from projects - which have been registered after 2012- in LDCs. The EU has clarified that as of now (although this may be subject to change), it will allow credits into Phase III from CPAs in all countries included after 2012, as long as the PoA was registered prior to the end of 2012; this is further incentivizing project developers to pursue PoAs, even if there remains added challenges of pursuing PoAs rather than CDM projects.

Rwanda is a country that can serve as a model for other African countries looking to increase the number of PoAs in their country. With a reinforced DNA actively promoting PoAs and the carbon market, the number of PoAs which include Rwanda that are in validation have recently greatly increased; for a country the size of Rwanda, which until recently had only one registered CDM project, this increase is a significant achievement.

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**Courtney Blodgett**

I came to Rwanda in July 2009, as part of a UNDP funded capacity building project; my mandate was to establish DNA procedures, provide trainings and promote carbon market projects. I undertook this role for one year and, since August 2010 have been an independent consultant working, among other things on PoAs in Africa. Since my arrival in July 2009, the increase in the level of interest in PoAs in Rwanda has been remarkable. I worked closely in 2009 with Manna Energy during the development of the two now registered water purification projects. The pros and cons of applying programmatic CDM vs CDM were reviewed closely and, at the time, taking the risk of applying programmatic CDM just did not make sense. However, now, two years later, project developers are very eager to do PoAs in Rwanda, and in the region, and this is very encouraging.

It should be noted, though, that programmatic CDM is still far from perfect. One major issue is the lack of trust by project developers in the development of PoAs by other coordinating entities. This lack of trust is mainly due to questions about how a baseline is established and about clarity of procedures surrounding the inclusion of new CPAs and issuance.
Why Does The Concept Of Programmes Of Activities (PoAs) Fit For Africa?

Potential
The Carbon Market in Africa has improved noticeably due to recent developments with an emerging international trend towards programmatic approaches and least developed countries. The establishment of the PoA (programme of activities) approach leads to a stronger engagement particularly in microscale project activities in the developing countries. This approach and the regulations for the next phase of the EU ETS are the main reasons that the focus is getting closer on the African CDM market. This implies that there is also a need to reinforce the support for investments in Africa to assist the continent to actively participate in the carbon market. Compared to other regions the share of CDM projects in Africa has been very limited; currently the continent hosts just around 2% of the total number of registered CDM projects.

The PoA is an instrument to reduce transaction costs by bundling a number of homogenous projects under one programme activity, and Africa provides a big variety of microscale activities which are eligible for the PoA approach. This is reflected in the increased share of Africa in the PoAs pipeline, which is now around 24% of the total PoAs (see figure above).

Microscale Activities
Especially for small- and microscale activities there are a lot of advantages within the PoA model:

- Using economies of scale within project development and the project implementation by combining similar projects activities of similar nature – so called CDM Programme Activities (CPA)
- Technical approval is done once and can be used in several CPAs/locations,
- Reduction of costs regarding the inclusion of individual CPAs,
- Saving time if the CPAs are ready for implementation: CPAs can start at any time during the lifetime of the PoA.

Due to these reasons it can be attractive even for developers of measures with very low emission reductions per unit to apply for the PoA registration, especially after fulfilling the underlying CDM-requirements. However, to successfully exploit the PoA potential in Africa, more of result focussed capacity building initiatives for the design and successful implementation of PoAs remains to be needed. These initiatives should be directed towards mitigating key barriers, notably the financial and institutional hurdles.

This would give developers of micro-scale projects in Africa an opportunity to participate in the carbon market, and eventually add valuable contributions to the sustainable development of the region. As many least developed countries (LDCs) only recently developed the required institutional preconditions at a national level, it would be necessary to further support this...
process in order to tap the full potential; special focus should be on enhancing the capacity of the DNAs in the selected countries. Typical sectors potential for micro-scale PoAs in Africa, and which demand strong support include:

- Energy demand (i.e. energy efficiency projects on the supply side e.g. micro-hydro plants, as well as the demand side solar water heaters, efficient cook stoves, energy efficiency in buildings, and lighting)
- Energy industries (i.e. switching to less carbon intensive fuels e.g. HFO or diesel to NG or use of geothermal, wind, biofuels, solar etc)
- Energy distribution (i.e. reducing transmission and distribution losses in local grids)
- Waste management (i.e. aerobic landfills, landfill gas capture and flaring, waste to energy, composting, and recycling)
- Agriculture (i.e. efficient use of nitrogen fertilizers, water use efficiency that reduces energy consumption, avoided methane production e.g. rice cultivation).

**Status Quo of Programmes of Activites (PoAs) in Africa**

Looking at the current pipeline of the PoAs in Africa, it is remarkable that many of these are coordinated by state-owned entities or national energy agencies. For small and medium sized private companies it is often very difficult to mobilize sufficient capital or access loans for the initial implementation of PoAs, mainly due to companies’ low creditworthiness. In addition it is a challenge to deal with all the CDM regulations and find sponsors for the CDM documentations. Currently, Africa hosts four registered PoAs while twenty-three are in validation (UNEP Risoe, Aug. 2011).

**Programmes of Activites (PoAs) in Africa - Regulatory Aspects**

The CDM Executive Board (EB) decisions have so far been focusing on simplifying some of the challenging CDM modalities/regulations in order to ease an access for LDCs to participate in the Carbon Market. Africa has thirty-four LDCs (including the Southern Sudan), and any changes on the modalities/regulations could have impacts on the success of PoAs on the continent.

**Standardized Baseline**

Establishing project baselines has been one of the key barriers facing CDM in Africa. Standardized baselines (SBs) allow countries to calculate typical emissions for an entire sector and create a list of technologies/measures that automatically qualify for approval because of their ability to reduce emissions below that baseline level. At the Conference of the Parties in Cancun, Parties agreed on the implementation of SBs under the CDM, and the “Guidelines for the establishment of sector specific SBs” were approved by the CDM EB in its recent meeting in Marrakech.

Basically, the application of the SBs can assist Africa to get more access to the PoAs through lowering the transaction costs, calculating the baseline emission factors, determining the additionality, setting baseline emissions in specific sectors, enhancing transparency, and ensuring environmental integrity. However, one of the key challenges remains to assure the availability of the expertise on a technical and institutional level to take SBs to actual approval and implementation.

**Additionality**

Of a particular importance for PoAs development in Africa is the decision by the CDM EB on new modalities regarding the additionality. The EB now allows developers of PoAs of so called micro scale projects to demonstrate CPA addi-

cionality through a simplified approach. In general terms the additionality of a PoA has to be proven either based on a full scale additionality assessment on the CPA level or through criteria that a defined CPA has to fulfill and which are applicable for the entire PoA. In addition CPAs with micro scale projects in least developed countries and small island states are additional automatically.

**Regional GEF**

Most countries in Africa have very low grid emissions due to the dominance of hydropower in electricity grids. Countries like Ethiopia, Zambia, DRC, and Mozambique have large shares of their electricity generated from hydro; thus have very low emission factors (EFs), making them less attractive to CDM. Contrary, there are few countries in Africa such as South Africa, Lesotho, Zimbabwe, and Botswana with high EFs because of the fossil fuels dominancy. Such countries appear to have inter-connected grids with many other countries with low EFs, thus the need for a regional EF. Basically, the regional EF allows countries with low EFs to improve them using a calculated average EF of a certain set of countries with inter-connected grids. Regional EF will enhance access to more PoAs in Africa for clean electricity producers in countries dominated by renewable sources.

Potential regional EF in Africa could be developed based on the Southern African Power Pool (SAPP) inter-connected grid. UNEP Risoe Centre of Denmark is currently developing an EF in the region in an attempt to improve accessibility to carbon finance including PoAs by under-represented countries in Africa. Although the CDM EB is allowing the development and ap-

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1 Decision 3/CMP.6
2 EB meeting 62, Annex 8
3 EB meeting 60, Annex 25.
Application of regional EFs, there are still key regulatory issues in the modalities which could potentially hinder the implementation of the regional EFs in Africa. One is the requirement for issuance of Letter of Approvals (LoA) to the project by each involved national CDM authority (DNAs) included in the calculation. Due to different regulations, and institutional framework in different countries, this requirement can potentially cause unavoidable delays to projects. It should also be mentioned that the EB allowed simplified options for the calculation of the GEF for project activities hosted in countries that have not sufficient data and that are located in LDCs or countries with less than ten registered projects at the starting date of validation4.

Suppressed Demand
The baseline is a projection of GHG emissions that would have occurred without the project. As mentioned, in Africa establishing baselines, especially for micro-scale project activities has proved to be a challenge. A suppressed demand is a scenario where future anthropogenic emissions by sources are projected to rise above current levels, due to the specific circumstances of the Host Party.

At two conferences the Parties recommended to the CDM EB to explore and endorse the inclusion of a suppressed demand scenario in baseline and monitoring methodologies. Subsequently, the guidelines on the consideration of suppressed demand in CDM methodologies were approved during the recent EB meeting in Marrakech. The guidelines include ways to calculate emission reductions in poor areas where the demand is suppressed due to a budget constraint or lack of infrastructure. The emission reduction is made against a benchmark that represents so-called minimum service levels for heat, water and light, which represent an acceptable standard of living, which poor communities have not yet achieved.

This new development may promote PoAs expansion in Africa, especially in projects that proved to be challenging to realize such as energy saving stoves, energy saving bulbs, sustainable charcoal production, small hydro, water purification, and small wind farms.

Simplification of Monitoring
Compared to standard CDM projects, PoAs require specific monitoring approaches. This may pose a challenge even for project developers and auditors especially during the validation/verification of CPAs. For instance, the inappropriate validation/verification of CPAs may lead to erroneous inclusions of the CPAs.

Furthermore, the large number of individual CPAs - as it is the typical design feature of a PoA - will frequently involve some sort of sampling in the monitoring in order to maintain cost effectiveness; this however also requires specific expertise and capacities.

The fact that PoAs involve micro-scale project activities, which may imply the distribution and accounting of many small units in different geographical areas, simplified monitoring systems and standards should be applied. This goes largely hand in hand with the SB approaches discussed above. The introduction of these simplified monitoring systems and standards will reduce transaction costs, save time, increase transparency, and enhance the PoAs performances especially in Africa, where resources are scarce.

A number of further ideas were recommended to the CDM EB by the CDM stakeholders through the public consultations to simplify the monitoring of PoAs, specifically by improving the application of sampling methods. The ideas which could potentially promote PoAs in Africa include:

1. Provide standard and improved guidelines for the application of sampling in the context of PoAs,
2. Provide best practice guidance for application of sampling,
3. Include conservative default factors and/or standardized baselines in the methodologies,
4. Provide procedures for sampling in respective methodologies,

Financial Aspects
Developing a good business plan and finding a strong financial partner are essential success factors for implementing a PoA. Only if the Programme Coordinator can demonstrate the capability to accomplish all the essential steps in structuring, implementing and operating the programme, will the PoA be interesting for investors.

In considering the financial viability of a PoA, carbon revenue can be a crucial additional source of income. However, especially in Africa, the need for start-up capital is often a major barrier for the development and implementation of projects. Beside those initial investment costs, the costs for the CDM cycle (PDD, validation, registration) have to be covered, too. Therefore the financial viability of a PoA should be checked at an early stage, bearing in mind that carbon revenue will be gradually coming at a later stage of the programme activity. The gap between initial investment outlay and later carbon

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cash flow could be bridged through financing solutions that collateralize the future carbon revenue (carbon finance). Experience shows, though, most financial institutions in Africa are reluctant to consider carbon income in assessing a project’s financial viability. Consequently, there have been little attempts at commercial carbon finance structures.

Sourcing public support in the form of seed funding, subsidies, grants or any other form of concessional financing options mitigates the financing barrier. In addition, it helps when a financial institution with an affinity to innovation and risk who is willing to share in the financing of initial project costs (e.g. pre feasibility studies, stove/CFL purchase and distribution). Mustering public support and venture-based private commitment together then is a realistic approach to financing a PoA in Africa. While such financing inevitably requires effort and pro-activeness on the part of the project originator, an experienced and well-connected promotional partner can certainly help.

**Challenges and Lessons Learnt in PoAs**

Beside the crucial point of sufficient funding the success of a PoA is reliant on the strengths of the implementing organisation. Finding a suitable local organisation in Africa is a challenge. They have to have enough experience in programme development and the necessary creditworthiness to be attractive to investors. This is why international aid organisations and government agencies often act as implementing organisations. Local African banks have gained little CDM experience to date. KfW has had positive experience with local private consulting firms because they are responsive, can deal with CDM issues competently, and work in a solution-oriented manner. Still, when implementing a programme, they often need additional partners: one to help with the organisational side and a strong financial partner (such as a local bank) who can handle payment flows.

In addition, a PoA has to be structured in a way that the role and responsibilities of all partners involved in the programme are defined in a clear and transparent manner. It has also to be assessed thoroughly whether all stakeholders can fulfil their intended role adequately.

Beyond the CME and the structural setup of a PoA the potential of the programme to generate CERs must be in a good balance in relation to the CDM related transaction costs of the programme.

**Further reading and information:**

- Link to PoA Blueprint Book
  [http://www.kfw.de/kfw/en/KfW_Group/Sustainability_and_Climate_Protection/PoA_Support_Centre_Germany/PoA_Blueprint_Book.jsp](http://www.kfw.de/kfw/en/KfW_Group/Sustainability_and_Climate_Protection/PoA_Support_Centre_Germany/PoA_Blueprint_Book.jsp)

- Website of KfW Carbon Fund

- Recommendations related to PoAs arising from stakeholder consultations
  [http://cdm.unfccc.int/UserManagement/FileStorage/CVP8U-W1E6TXJNH7RS3ZD0QO2YBK4AL](http://cdm.unfccc.int/UserManagement/FileStorage/CVP8U-W1E6TXJNH7RS3ZD0QO2YBK4AL)

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Rainer Suennen is responsible for KfW’s carbon activities in Africa. He has over seven years experience in carbon markets, in the first years focusing on the launch and implementation of different carbon purchase programmes. Prior to that he was project manager in the venture capital and private equity business. The KfW Carbon Fund is KfW’s procurement platform for project-based carbon credits and offers tailor-made services for CDM/II projects and PoAs.

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Alice Seitz is responsible for programmatic CDM projects at KfW Carbon Fund. She has over four years experience in carbon markets and is coordinating the public relations and knowledge management activities of KfW’s PoA Support Centre.

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Abbas Kitogo is Local Expert at KfW Office Kenya in Nairobi. He is responsible for the acquisition of projects in Sub-Saharan Africa. Abbas has several years of experience in carbon markets.