REPORT

IETA
INTERNATIONAL EMISSIONS TRADING ASSOCIATION

GHG GREENHOUSE GAS MARKET 2013

THE 10th EDITION

looking to the **future** of carbon markets

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ITRI Industrial Technology Research Institute

GREENHOUSE GAS MARKET 2013

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10 THE 10th EDITION

IETA GREENHOUSE GAS MARKET 2013 REPORT

THE MARKETS
Existing Policies Around the World

THE FUTURE
Carbon Markets On The Rise

THE DESIGN
Examining What Makes Climate Policy Tick

THE BRIDGES
Aligning Markets Within a Fragmented Architecture

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THE 10th EDITION

Dirk Forrister
President and CEO,
IETA

GHG Market Report 2013:
Looking To The Future Of Carbon Markets

ON THE GLOBAL POLITICAL STAGE, climate change often occupies a space in the background. It affects many other issues – environment, energy, economic and security. Any crisis of the moment is capable of upstaging the climate issue – since leaders perceive it as always important, but rarely essential to their local politics. For that reason, climate decisions are too often prone to delay. At least, until something bad happens. And then policymakers have lots of explaining to do.

That's why climate negotiators set deadlines for major decisional conferences – like Kyoto and Copenhagen. The next "big event" for climate decisions is set for Paris in 2015. No one wants another circus like Copenhagen – so this time, there is pressure to resolve issues earlier (like in Peru next year?) to avoid testing the "Big Bang Theory" of climate policymaking again.

Nevertheless, the Paris date will serve as the main fulcrum for leveraging major decisions – on the governance framework, technical standards for MRV, market mechanisms, technology and finance. In the COPs planned for Warsaw and Peru, these issues will be fleshed out and texts will begin to emerge.

It is critical for business to remain engaged, because the markets of the future will be shaped in this process. We must maintain a strong, consistent voice in favor of market-based approaches. With markets emerging around the world, we have more allies than ever – but the challenges are growing stronger, given the latest scientific reports.

This report surveys the landscape of greenhouse gas market development – from its scientific drivers through its growth prospects and operational challenges. It will delve into international policy design as it impacts an increasingly "bottoms up" world of national and subnational markets. It will investigate how linkages between markets could emerge to deliver more robust benefits.

Science Drivers:
The 4 numbers that matter

For business, science is the fundamental driver behind the policy decisions adopted at local, national and international levels.

The climate negotiations are about to get a strong push from the scientific community. In the 5th Assessment Report from the Intergovernmental Panel on Climate Change described by leading IPCC scientists in these pages, the scientific imperative for action is becoming more clear.

In IETA communications, we typically focus on three key numbers: the Copenhagen aim of preventing warming of more than 2° C, which implies limiting atmospheric concentrations to around 450 parts per million – which in turn implies that emissions from the developed world must be reduced by 80% or more.

But we need to learn a fourth number: The IPCC's latest report introduces a new concept –the "1 Trillion Ton" budget for emissions this century. The IPCC says we've passed the 500 billion mark. Researchers project that, without effective mitigation measures, we're set to emit the 1 trillionth tonne in 2040 and leave the emissions budget empty for the remainder of this century.

The global community needs to come together behind a broad set of solutions, powered by market mechanisms. To meet this need, we'll need a robust network of international carbon markets – with Europe, Asia and the America's linked to promote action where it can reduce emissions the fastest and cheapest. We'll also need Carbon Capture and Sequestration (CCS) and other technological solutions to deliver in a big way.

Market Growth and Future of Linkages

In 2013, carbon markets continued to advance across the globe. While traded volumes in traditional European and Kyoto markets declined, new markets in California and Shenzhen began to trade – albeit with low volumes and cautious participants. But more markets are poised to launch, from other Chinese pilots to Kazahkstan and South Korea.

Importantly, discussions on linking and market coordination moved from the academic to the practical, offering an encouraging sign for the future.

Many market participants expected the first major links to emerge between the EU ETS and the Australian market. After Australia's elections in 2013, this prospect grew more uncertain with the new government's pledge to abolish the current pricing program. The new Australian government is setting the stage for change, but the process is far from complete. As a result, the future for fully linked markets may prove to be a dream deferred. But other markets offer more positive signs.

China is working diligently to design its national carbon market with a view to future links with others. It enjoys collaborative working relationships with Europe, Australia and California, all aimed at harmonizing designs while preserving domestic priorities. Chinese leaders aim to get their national market up and running before engaging in formal links – but they intend to design it to be "linking ready" for the future.

At Carbon Forum North America, Québec's Environment Minister Yves-François Blanchet announced that his government had reached agreement with California on a market linkage. This will enable the formation of the first common carbon market at the state/provincial level in North America – a major breakthrough.

These national and sub-national steps could influence global policy developments. At the international level, negotiations on a "framework for various approaches" (FVA) and a "new market mechanism" (NMM) afford a valuable opportunity to use international institutions to assist in linking markets - and to deliver the economic benefits broader market coverage brings.

Offsets and Standards

Another characteristic of the post-2012 era involves expanded routes for obtaining offset supplies. The leading examples are California/Quebec and Japan.

In California and Quebec, the offsets markets are slow but steady – with California issuing its first compliance offsets in August and Quebec soon to follow. Each of these jurisdictions is operating its own offsets program, which draws on wider international developments. But they also offer innovative crediting opportunities not seen under the Kyoto Protocol, such as destruction of ozone depleting substances (ODS). 2014 will see this market grow as the programs link and more projects are approved by the regulators.

Japan's "Joint Crediting Mechanism" (JCM) is bringing technology, climate and development policy together as an alternative to the CDM for the 2013-2020 period. Again, designers of the JCM are taking lessons from the CDM in adopting methodologies for their programs, which will operate under supervision of joint committees with developing country partners. Many questions remain about the ultimate fungibility of these instruments in international markets. But they are proving to be an attractive testing ground for key jurisdictions, like Indonesia, Kenya and Mongolia to explore new crediting alternatives.

Climate Finance

Climate goals require financing to become a reality. Market mechanisms have shown the power of carbon finance to make progress possible towards reducing emissions. But the discussion has to be broader, so that large scale capital financing can be channeled to assist in major infrastructure change.

As nations grapple with how to mobilize sufficient financing for the climate challenges, one thing is clear: public financing alone is not enough. There must be

solutions that attract private sector financing in order to meet the need.

In 2013, the business community began a concerted effort to engage in the development of the Green Climate Fund (GCF). The fund is taking shape in fits and starts, trying its best to avoid the pitfalls of paralysis that so often plague climate negotiations. But unfortunately, the Board's operations reflect some of the same hallmarks of climate talks – and are in dire need of a strong dose of pragmatism.

Building Business Networks for Climate Progress

To achieve the ambitious change surveyed in this report, the business community must continue building knowledge and capacity around the world. Despite the best intentions of policy-makers, no emissions market works unless business makes it work – by participating and delivering the benefits of emissions reduction, technology deployment and financial innovation.

The tool of emissions trading is new to business in many parts of the world – so there is a huge need for experienced market professionals to share their experiences and build confidence with business counterparts around the world. It's one thing for a government official to tell a company about the benefits of emissions trading. But its quite another for a business professional to discuss with a colleague how it works in practice – and how a company can remain profitable and grow its business while meeting climate goals.

In 2013, IETA members launched the "Business Partnership for Market Readiness (B-PMR)," an initiative to conduct business-to-business dialogues with corporate participants in new carbon markets. With missions in China and South Korea, the B-PMR helped inform the main industrial players about market preparedness and good business practices. Next year, we hope to expand our reach to a few new jurisdictions.

Strengthening the Core

Finally, this year the carbon market community worked hard to create opportunity from the many challenges in the EU ETS. We remind ourselves that it is still early days in carbon markets, so it is important to stick to the fundamentals and continue building a strong market infrastructure for the decades to come.

In recent years, Europe's carbon markets slumped due to multiple factors: the economic decline in Europe, market impacts of complementary measures to the EU-ETS, and uncertainty about future policy requirements. In response, the European Commission continued to advance its case for "backloading" as a near term measure. After a successful vote in the EU Parliament, "trialogue" negotiations are expected to take place between the European Council, the Parliament and the Commission. Decisions are due in the near future, which will ultimately be subject to a formal endorsement by the Parliament and European Member States.

Alongside this "near term" effort, the Commission began a diligent effort to consult with business on structural reforms for the post 2020 market – and start reflecting on Europe's 2030 energy and climate policy. With six structural measures under review, attention in Brussels is narrowing – with increasing attention on the merits of an automatic supply adjustment mechanism to address extreme changes in demand levels.

In the longer term, it is essential that policymakers focus on ways to consolidate the policy agenda, with the ETS as its central pillar. This consolidation needs to integrate renewable energy and energy efficiency measures into the market structure – and it needs to satisfy Member States that auxiliary national measures can be phased out.

The future of carbon markets is challenging, because near term political trends are so dominated by broader concerns about restoring the global economy. Yet there is a profound need to address climate concerns –and a wealth of associated market opportunities.

Just remember the "Big 4" numbers: 2° C, 450 ppm, 80% reduction and 1 Trillion Tonnes.

Dirk Forrister
President and CEO
International Emissions Trading Association (IETA)

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...aligning Economy with Ecology

Society and businesses continue to confront mounting risks arising from climate change and resource depletion, whilst striving to meet the burgeoning demands of a growing global population. Today, we use the equivalent of nearly two planets to meet demand for natural resources and waste absorption, meaning that we make our living through an unsustainable drawing down of Earth's 'natural capital', rather than living off of the 'interest'... We have now reached the point where these limits are increasingly felt and where, as a result, ensuring the wellbeing and prosperity of present and future generations requires a realignment of economic principles with ecological realities.

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CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS

On 27 September 2013, the Intergovernmental Panel on Climate Change (IPCC) meeting in Stockholm, Sweden, approved the Summary for Policymakers of the Working Group I contribution to the IPCC's Fifth Assessment Report (IPCC WGI AR5) and accepted the underlying report Climate Change 2013: the Physical Science Basis[Δ]. With this milestone, the first of three major IPCC reports was launched; the second on Impacts, Adaptation and Vulnerability will be released in March 2014 and the third on Mitigation of climate change in April 2014. The IPCC's fifth assessment cycle will be completed in October 2014 by a short Synthesis Report that draws on the assessments made by all three Working Groups.

IPCC reports are policy-relevant but not policy-prescriptive. It is the role of the IPCC to provide governments with a comprehensive assessment of the most up-to-date scientific technical and socio-economic knowledge on issues related to climate change. Climate change projections assessed are based on a range of specific scenarios. From this assessment, policymakers obtain information on potential consequences from climate change depending on the scenario.

The Working Group I contribution to the IPCC's Fifth Assessment Report

The Working Group I report was developed by an international team of 259 scientists who were selected in May 2010, and also involved over 600 contributing authors. Like all IPCC reports, it went through a multi-stage review process with over one thousand expert reviewers worldwide as well as governments. The author teams comprehensively assessed sources of scientific and technical information in the course of their work and over 9,200 scientific publications are cited in the WGI report, more than three-quarters of which have been published since the last IPCC assessment in 2007.

As well as the short Summary for Policymakers, the report has a longer Technical Summary and 14 chapters. Nineteen headline statements in the Summary for Policymakers serve as a compact, concise and comprehensive narrative for the Summaries and the full report. The 14 chapters of the report include an assessment of observations of the climate system, with separate chapters covering changes in the atmosphere and surface, the ocean and the cryosphere, as well as information from paleoclimate archives. The assessment report further includes chapters dealing with the carbon cycle, the science of clouds and aerosols, radiative forcing and sea level change. Coverage of climate change projections is extended compared to earlier IPCC assessment reports by assessing both near-term and long-term projections in separate chapters. Monsoon systems, the El Niño phenomenon, and many other modes of climate variability are covered in a chapter on climate phenomena and their relevance for future regional climate change. An innovative feature of the WGI AR5 is the Atlas of Global and Regional Climate Projections (Annex I), which is intended to enhance accessibility for users and stakeholders.

This comprehensive and robust scientific assessment provides a firm foundation for considerations of the impacts of climate change on human and natural systems and ways to meet the challenge of climate change.

Observed changes

Observations of the climate system are based on direct measurements and remote sensing from satellites and other platforms. Global-scale observations from the instrumental era began in the mid-19th century for temperature and other variables, with more comprehensive and diverse sets of observations available for the period 1950 onwards. Paleoclimate reconstructions extend some records back hundreds to millions of years.

*IPCC Working Group, Technical Support Unit; †IPCC Working Group, Co-Chair [Δ] IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T. F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, P. M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, in press.

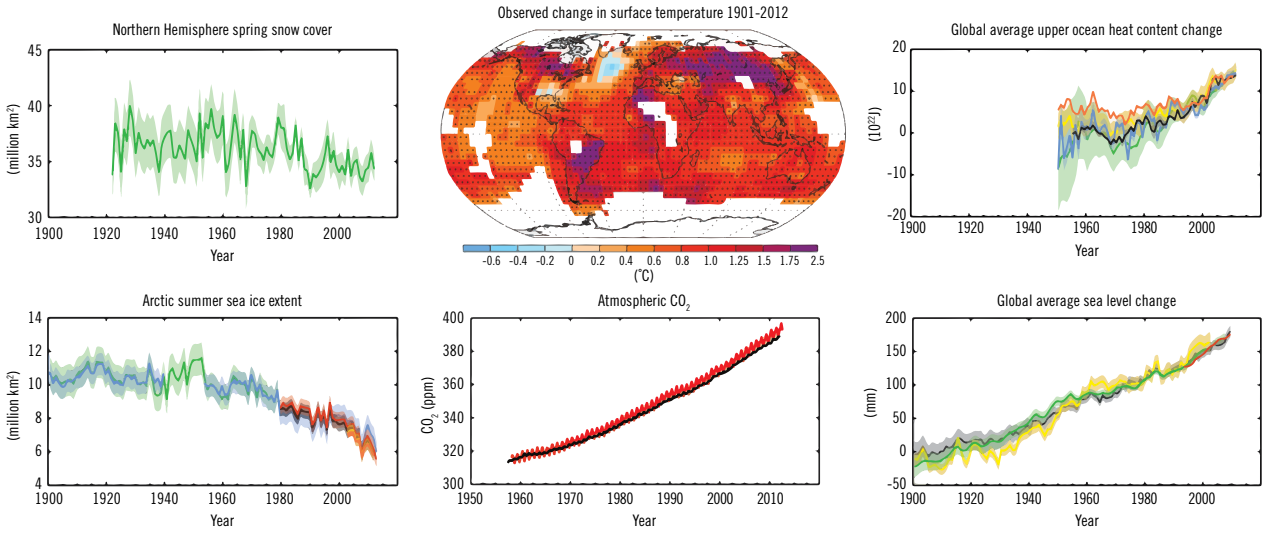

FIGURE 1: MULTIPLE OBSERVED INDICATORS OF A CHANGING GLOBAL CLIMATE. THE MAP SHOWS OBSERVED SURFACE TEMPERATURE CHANGE FROM 1901 TO 2012 DERIVED FROM TEMPERATURE TRENDS DETERMINED BY LINEAR REGRESSION. TRENDS HAVE BEEN CALCULATED ONLY WHERE DATA AVAILABILITY PERMITS A ROBUST ESTIMATE, AND ALL OTHER AREAS ARE WHITE. THE '+' SIGN INDICATES WHERE THE TREND IS SIGNIFICANT. TIME SERIES OF OBSERVED CHANGES ARE: EXTENT OF NORTHERN HEMISPHERE MARCH-APRIL (SPRING) AVERAGE SNOW COVER; EXTENT OF ARCTIC JULY-AUGUST-SEPTEMBER (SUMMER) AVERAGE SEA ICE; CHANGE IN GLOBAL MEAN UPPER OCEAN (0–700 M) HEAT CONTENT; CHANGE IN GLOBAL MEAN SEA LEVEL. FOR THESE TIME-SERIES, COLOURED LINES INDICATE DIFFERENT DATA SETS, AND WHERE ASSESSED, UNCERTAINTIES ARE INDICATED BY COLOURED SHADING. CHANGE IN ATMOSPHERIC CONCENTRATIONS OF CARBON DIOXIDE (CO_2) FROM MAUNA LOA (RED) AND SOUTH POLE (BLACK) ARE SHOWN SINCE 1958. BASED ON WGI AR5 SPM AND MODIFIED FROM SPM FIGURES 1, 3 AND 4.

Observations of changes in the climate system are thus based on multiple lines of independent evidence (see Figure). The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased.

The IPCC's Fourth Assessment Report (AR4) in 2007 already concluded that warming of the climate system is unequivocal. It is now assessed that many of the observed changes since the 1950s are unprecedented over decades to millennia. Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850. In the Northern Hemisphere, 1983–2012 was *likely*[‡] the warmest 30-year period of the last 1400 years. The rate of sea level rise since the mid-19th century has been larger than the mean rate during the previous two millennia.

Ocean warming dominates the increase in energy stored in the climate system, accounting for more than 90% of the energy accumulated between 1971 and 2010. Over the last two decades, the Greenland and Antarctic ice sheets have been losing mass, glaciers have continued to shrink almost worldwide, and Arctic sea ice and Northern Hemisphere spring snow cover have continued to decrease in extent.

The atmospheric concentrations of carbon dioxide (CO_2), methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. CO_2 concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions and secondarily from net land use change emissions. The ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide, causing ocean acidification.

Drivers of climate change

Natural and anthropogenic substances and processes that alter the Earth's energy budget are drivers of climate change. Radiative forcing quantifies the change in energy fluxes caused by changes in these drivers; positive radiative forcing leads to surface warming, negative radiative forcing leads to surface cooling.

The assessment finds that total radiative forcing is positive, and has led to an uptake of energy by the climate system. The largest contribution to total radiative forcing is caused by the increase in the atmospheric concentration of CO_2 since 1750. The total natural radiative forcing from solar irradiance changes and stratospheric volcanic aerosols made only a small contribution to the net radiative forcing throughout the last century, except for brief periods after large volcanic eruptions.

Understanding the climate system and its recent changes

Understanding recent changes in the climate system results from combining observations, studies of feedback processes, and model simulations. Compared to AR4, more detailed and longer observations and improved climate models now enable the attribution of a human contribution to detected changes in more climate system components. In the WGI AR5, the IPCC is now able

[‡]Italics are used to denote formal IPCC probabilistic terminology indicating the assessed likelihood of an outcome. Where appropriate, other findings are simply formulated as statements of fact without using this terminology. See Chapter 1 of the IPCC Working Group I Fifth Assessment Report for further details on the uncertainty terminology used.

to state as a fact that human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system.

Observational and model studies of temperature change, climate feedbacks and changes in the Earth's energy budget together provide confidence in the magnitude of global warming in response to past and future forcing.

Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes. This evidence for human influence has grown since AR4. It is *extremely likely* that human influence has been the dominant cause of the observed warming since the mid-20th century.

Future global and regional climate change

Projections of changes in the climate system are made using a hierarchy of climate models ranging from simple climate models, to models of intermediate complexity, to comprehensive climate models, and Earth System Models. These models simulate changes based on a set of scenarios of anthropogenic forcings. A new set of scenarios, the Representative Concentration Pathways (RCPs), was used for the new climate model simulations. The four scenarios of future greenhouse gas concentrations and aerosols span a wide range of possible futures.

It is evident that continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions.

Projections of future warming are also considered with reference to climate targets such as 2°C or 1.5°C relative to 1850 to 1900. The assessment finds that global surface temperature change for the end of the 21st century is *likely* to exceed 1.5°C in all but the lowest scenario considered, and *likely* to exceed 2°C for the two high scenarios. Warming will continue beyond 2100 under all RCP scenarios except the lowest. Warming will continue to exhibit inter-annual-to-decadal variability and will not be regionally uniform.

Heat waves are *very likely* to occur more frequently and last longer. As the Earth warms, currently wet regions are expected to receive more rainfall, and dry regions to receive less, although there may be regional exceptions. As the ocean warms, and glaciers and ice sheets reduce, global mean sea level will continue to rise, but at a faster rate than experienced over the past 40 years.

Stabilisation of global temperature requires limiting cumulative CO_2 emissions to a finite budget.

Stabilization of global temperature requires limiting cumulative CO_2 emissions to a finite budget. The assessment finds a near-linear relationship between total cumulative CO_2 emissions and global temperature change. Cumulative emissions of CO_2 largely determine global mean surface warming by the late 21st century and beyond. For any given temperature target, higher emissions in the earlier decades therefore imply lower emissions by about the same amount later on. Most aspects of climate change will persist for many centuries even if emissions of CO_2 are stopped. This represents a substantial multi-century climate change commitment created by past, present and future emissions of CO_2.

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Gian-Kasper Plattner holds the position of Science Director at the IPCC WGI TSU since 2009. He has a PhD in Climate and Environmental Physics and held research positions at the University of California Los Angeles, University of Bern and ETH Zürich. His research focuses on the contemporary and future carbon cycle from regional to global scales, using a hierarchy of numerical physical-biogeochemical models to study the ocean component of the Earth System and its role in nutrient and carbon cycling and climate.

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Simon Allen is the Senior Science Officer at the IPCC WGI TSU, where he has been employed since 2009. Prior to this, he earned his PhD at the University of Canterbury, New Zealand. His primary role has been to support the scientific development of the Fifth Assessment Report. His research interests are in the general fields of glaciology and climate change impacts in high mountain regions.

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Pauline Midgley was appointed Head of the IPCC WGI TSU in 2009. She has a PhD in atmospheric chemistry and her career path has taken her from the UK to the USA and Germany, coordinating environmental research activities in the halocarbon industry, in a European-wide project on tropospheric research, and providing scientific support to the Global Change Division of the German Federal Ministry of Research. From 2006 she ran the German IPCC Coordination Office.

Thomas Stocker
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Thomas Stocker was elected Co-Chair of IPCC WGI in 2008. A natural scientist, he has held research positions in the UK, Canada and the USA. Since 1993 he has been Professor of Climate and Environmental Physics at the University of Bern. His research encompasses the development of climate models of intermediate complexity, modelling past and future climate change, and the reconstruction of the chemical composition of precipitation and greenhouse gas concentrations based on ice cores from Greenland and Antarctica.

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THE STATE OF CARBON PRICING AROUND THE WORLD – AN OVERVIEW

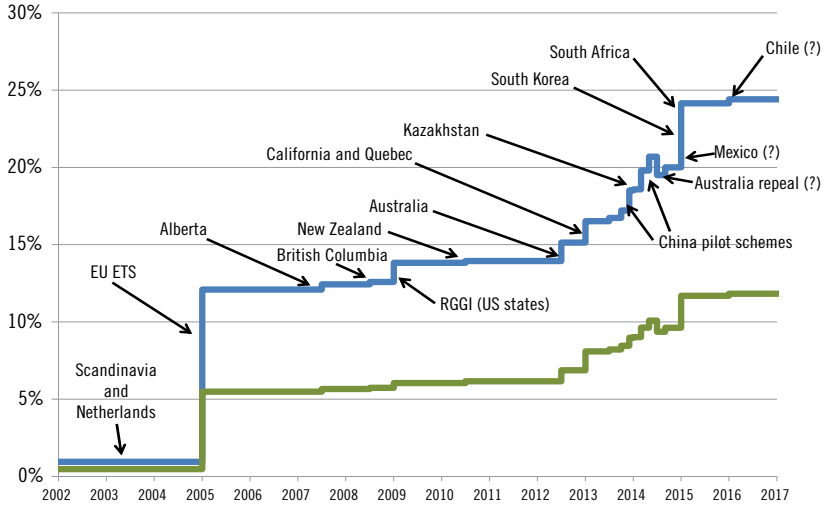
THE SPREAD OF CARBON PRICING: Carbon pricing's spread around the world over the last decade has been remarkable. Once confined to a few small northern European economies, it has become a worldwide phenomenon, with more than a dozen major schemes either in place or under development around the world. Two or three years from now, assuming current programmes run to schedule, carbon pricing will be in place in jurisdictions that together account for a little under a quarter of total global CO_2 emissions from energy and industrial processes (see Chart – Blue Line). If carbon pricing in China extends nationally coverage will increase to over 40%.

Not all emissions in these jurisdictions are priced, as some governments seek to reduce emissions in particular sectors, for example surface transport in the EU, using other policy instruments. Nevertheless, over 10% of the world's energy and industry CO_2 emissions are likely to be priced by around the middle of this decade (see Chart – Green Line).

The diversity of approaches

Parts 1 and 2 of this report look at existing and forthcoming emissions trading schemes in the Europe, Asia, North America, and elsewhere. The picture that emerges is of vigorous and diverse activity, with different schemes reflecting different circumstances and regulatory approaches. For example, California is about to complete its first year of compliance within its cap-and-trade system, with traded volumes increasing as market participation escalates (Chapter 3). On the East Coast, the Regional Greenhouse Gas Initiative (RGGI) has completed its review and made substantial changes to the allowance budgets and the design of the market (Chapter 6). Further north, Québec is also moving ahead with its carbon market and has agreed its linkage with California. All of this is occurring against a backdrop of forthcoming federal regulations for certain sectors in the United States (Chapter 7).

CHART 1: COVERAGE OF CARBON PRICING IS INCREASING RAPIDLY.
Carbon Pricing Coverage
(energy and industry CO_2 emissions of jurisdictions with carbon pricing as a % of global emissions)

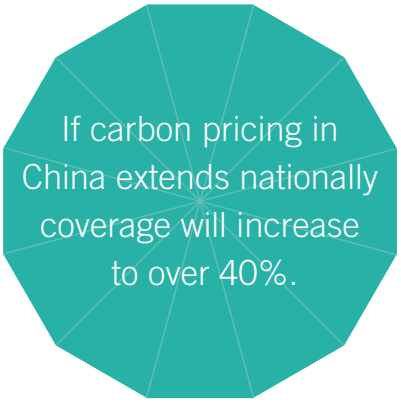


NOTE: THE BLUE LINE SHOWS THE PROPORTION OF WORLD ENERGY AND INDUSTRY CO_2 EMISSIONS OCCURRING IN JURISDICTIONS WITH CARBON PRICING, SO THAT IF ALL JURISDICTIONS HAD CARBON PRICING SCHEMES THIS LINE WOULD REACH 100%. THE GREEN LINE SHOWS THE PROPORTION OF GLOBAL CO_2 EMISSIONS FROM ENERGY AND INDUSTRY THAT ARE PRICED. THE GAP BETWEEN THE TWO LINES REPRESENTS THOSE EMISSIONS THAT ARE EITHER SUBJECT TO OTHER POLICY INSTRUMENTS IN JURISDICTIONS WITH PRICING, SUCH AS SURFACE TRANSPORT EMISSIONS IN THE EU, OR NOT COVERED BY POLICY AT PRESENT. QUESTION MARKS INDICATE LEGISLATION IN PROGRESS BUT NOT YET ENACTED OR WHERE IMPLEMENTATION APPEARS UNCERTAIN. SOURCE: RIO TINTO ANALYSIS.

As a consequence, an increasing body of experience is emerging around the world. Policy makers can draw on this experience to modify and improve their schemes over time. California has been able to learn from the EU experience (Chapter 19). The EU may now in turn be able to benefit from the experience of California and elsewhere. The fall in the price under the EU ETS, still the world's largest carbon market, has been one of the major features of the last year and this has heightened the debate about EU ETS reform (Chapters 1 and 2).

One continuing area of diversity is the extent to which schemes seek to manage both volumes and prices. IETA has always maintained that emissions markets have advantages over non-market instruments, and emissions trading has emerged as the predominant pathway to establish clear price signals across the world. However, governments may pursue carbon taxes to send price signals to emitters on abatement. Such measures may be well suited to their local circumstances, for example in small economies

such as British Columbia, or those such as South Africa where there is a need to establish administrative capacity. Yet even under a tax some of the benefits of trading can be realised. For example, trading of offsets is planned to form part of the proposed South African carbon tax (Chapter 12). Alberta, which limits emissions per unit of output rather than placing an absolute cap but allows trading around this, has a buyout price that effectively caps the market price, with payments going into a fund for clean investments, but it is looking to raise the level of this price, which may increase the potential for trading (Chapter 6).



A number of schemes, including California, Québec and RGGI use various allowance reserve mechanisms to contain prices and Korea is looking at potential responses to rapid price movements (Chapter 10). In China, the setting of prices seems likely to be subject to at least informal guidance, and there is consideration of whether a carbon tax may complement trading (Chapter 9). Kazakhstan will be learning the lessons of the pilot phase in 2013 to drive an effective carbon price for covered firms from 2014 onwards (Chapter 11). South Africa is moving ahead with a carbon tax, planned to be set at ZAR 120/tCO_2 but with the possibility of offsets to reduce the compliance costs faced by entities (Chapter 13). Indeed, looking across the schemes reviewed in section 1 and 2 what is striking is how, in practice, there is no dichotomy between trading and taxes, but a spectrum of design possibilities available to regulators that allow benefits from trading to be realised.

Common themes

Despite the diversity of approaches, many common themes are emerging as different jurisdictions tackle similar issues. Part 3 of the report looks at some of these themes.

Most markets allow for the use of offsets, but there is a great deal of variety in the quantity, types of offset, and place of origin allowed under different schemes (Chapter 15). The variety of rules for using offsets has been accompanied by a variety of offset protocols. Schemes in North America have tended to restrict offsets to those created in the state or province covered, or the country as a whole, thereby excluding international offsets. In contrast, the EU has welcomed these, though with growing restrictions. Australia had also made provision for extensive use of international offsets, but the new government has expressed its intention to move away from using international measures under its Direct Action scheme. Negotiations at the International Civil Aviation Organisation (ICAO) in October agreed to put in place a Market Based Mechanism for implementation by 2020, and offsets will form a major part of airline compliance with the sector's target (Chapter 14).

Schemes also vary in the choices they make about their coverage (Chapter 17). Some schemes, including the EU and pilot schemes in China, are restricted to large emitters, but others extend more widely. California and Quebec extend to gas distribution and transport from their second phase beginning in 2015. There is no clear trend over time, with some recent schemes favouring wider coverage and others remaining more restricted. This may it part reflect concern that emissions trading may not be the most appropriate tool for some sectors. For example, the EU already has very high gasoline taxes in many countries, equivalent to around USD 500/tCO_2 in the UK and Germany for example (if VAT on the duty is included in the estimate), plus increasingly stringent vehicle emissions standards, which are already creating strong pressure to reduce emissions.

Given the fragmented nature of carbon pricing globally all governments are concerned about industrial competitiveness. There is a remarkable similarity in the level of shielding given to emissions intensive trade exposed industry. However the details vary. For example the EU sets its benchmark at 100% of the best 10% of industry while Australia sets compensation based on 94.5% of industry average.

The approach to compensating for the increased costs due to emissions from electricity generation (indirect emissions) varies a good deal. In the EU it takes the form of direct financial compensation at the discretion of member states, in Australia allowances are freely allocated to large consumers, and in California freely allocated allowances are given to distribution companies which must use the funds to reduce the impact on consumers. However, the level is again somewhat similar across jurisdictions. The effect on different industries will depend very much on their circumstances, as detailed modelling makes clear (Chapter 18).

MRV is an area where there is much potential for transferring lessons (Chapter 16), and this is likely to be a particular issue for international emissions across sectors and regions. This will form a major part of the UNFCCCs future role in overseeing countries achieving their GHG reduction targets (Chapter 8).

Links between schemes

Part 4 of this report looks at emerging links between emissions trading schemes, which have the potential to lower the total cost of abatement. Linkage has been limited so far. The planned link between the EU and Australia now looks unlikely to proceed. The Quebec and California schemes are due to be linked in 2014. This was always intended, with both being members of the Western Climate Initiative (WCI), and with designs which have deliberately been aligned with this in mind. However, despite their integration there remain differences, for example in the scope of offsets. Linking also needs to be considered in the wider context of policy alignment, and the potential benefits derived from co-ordinating across design features and policies to harmonise approaches (Chapter 21).

Indirect linkage was expected by many to occur via offsets, with a common pool of offsets under the CDM providing some commonality between schemes, although not necessarily equalising allowance prices between schemes as offset volumes would be limited. However in practice there has been little commonality, with a wide diversity of arrangements for offsets among different emissions trading schemes. For example Japan is establishing its own international offset arrangements, the Joint Crediting Mechanism (JCM), to meet its own national abatement goals (Chapter 22).

There may be more to be gained in the near future from establishing carbon pricing schemes with similar infrastructures than from trying to match rules. The Partnership for Market Readiness (PMR) and its private sector equivalent the B-PMR have made significant progress in spreading understanding of what is needed to establish new carbon markets (Chapters 23-24). At the international level, these issues are being dealt with under the Framework for Various Approaches and New Market Mechanism (FVA/NMM) discussions between governments (Chapter 20). Opportunities also exist for greater coordination and alignment between carbon policies alongside the formal linking process (Chapter 21), although there remain advantages in innovation and diversity among schemes.

Financing Low Carbon development

Part 5 looks at the role that the UNFCCC and other international mechanisms might play in greater linkage, and in furthering the spread of carbon pricing. Establishing Nationally Appropriate Mitigation Actions (NAMAs) will play an important role in defining how countries can measure and improve their performance (Chapter 28). Some jurisdictions are likely to remain outside carbon pricing, at least for some years. However carbon pricing can continue to play a role in sustainable development through the use of offsets and the flow of funds to developing countries. There are several potential routes to finance including the Green Climate Fund (GCF), which remains a promising mechanism for getting funding flowing to developing countries (Chapters 27 and 30). Meanwhile the traditional instruments of CDM and JI may still have a role to play (Chapters 31 and 32). Reducing deforestation provides a critical component for global emissions reduction, with progress in Brazil in the last decade an example of what can be achieved. REDD+ has the potential to further this process (Chapter 28). Market mechanisms may also help finance adaptation (Chapter 33).

A way forward

The challenges of establishing emissions trading schemes can appear daunting. But international endeavours to spread knowledge, such as the PMR and B-PMR, are being complemented by bilateral exchanges of experience, such as those between China and the EU and that recently established between China and California. Such exchanges can only help the learning process.

Carbon pricing schemes are currently diverse, and this may create some lack of consistency in the price signal for abatement. However diversity remains a strength in many ways. It allows different approaches to be tried and lessons to be learned. Carbon pricing is still in its early days and the cycle of implementation, review, learning and revision is likely to continue to be the norm for some years to come. If this can take into account the widest range of experience it is likely to be all the more effective. If it does there seems no reason why carbon pricing should not continue its remarkable spread.

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Rio Tinto

THE MARKETS

EXISTING POLICIES AROUND THE WORLD

AUTHOR(S):
Sarah Deblock, IETA and Ingo Ramming, Commerzbank

EU ETS: THE CORNERSTONE OF FUTURE EU ENERGY AND CLIMATE POLICY?

Since 2005, the EU Emissions Trading Scheme (ETS) has been positioned at the crux of Europe's energy and climate policy response, driving reduced emissions using market forces. The EU-ETS is the EU's climate policy instrument to reduce CO_2 emissions cost-effectively. Many lessons have been learned during its operation. Looking forward, what does the future hold for EU policy and the ETS post-2020? What will be the key reforms and ideas that drive the ETS and maintain its central position in achieving the EU's climate goals?

Much attention has recently focused on the challenges facing the EU-ETS. In light of the ongoing economic downturn, proposals to reform the scheme have been dominated by concerns such as high-energy prices and the competitiveness of European industry. Moreover, with what is seen currently by many as a weak EU-ETS, some are considering other policies or targets as a means to reduce emissions, but which overlap with the Emissions Trading Scheme.

Looking forward, however, having an Emissions Trading Scheme as the EU's main climate policy instrument makes sense, despite the economic difficulties, as it ensures environmental objectives are achieved by using a business-friendly instrument.

A scheme that makes 'business-sense'

European heads of state have committed to reducing GHG emissions by 80-95% by 2050 compared to 1990 levels, as a joint effort on behalf of all developed countries. Despite the economic downturn, this commitment has not disappeared. However, climate change has, worryingly, moved to a secondary level in the political agenda. Other considerations have emerged and now form part of the climate policy debate: cost-effective access to energy and competitiveness are regularly part of the discussions on the EU's climate policy.

However, although climate change is no longer high on the agenda, the "do nothing" approach is not an option that is currently under serious consideration. With this in mind, policy makers need to consider what is the best instrument to reach the EU's long-term climate objectives, without creating additional burdens to European industry. IETA believes that a scheme such as the EU-ETS can deliver the EU's long-term climate goal in a flexible and cost-effective way, and makes not only climate sense, but also business-sense.

In order to reach the EU's long-term Greenhouse Gas objectives, there is no better instrument than the EU-ETS. Alternatives such as direct regulation can be effective in some sectors, but provide a direct intervention into how to regulate emissions, as opposed to allowing a choice into how emission reductions should take place. Taxes are also being considered in some jurisdictions and, although they can be helpful to raise awareness by putting a price on carbon, they fail to provide the guarantee that an environmental target will be reached. Moreover, taxes are set at a national level rather than at a European level, and lack coordination amongst European Member States, thereby undermining the level-playing field within the European internal market.

The economic circumstances in which the ETS is currently operating in, justify the advantages of a cap-and-trade scheme even more so. It benefits from a dual advantage of ensuring flexibility for market participants to choose the least cost option for reducing emissions, whilst also guaranteeing the achievement of an environmental objective. In contrast to the alternative instruments, industrial and climate considerations become compatible.

Looking forward, what does the future hold for EU policy and the ETS post-2020?

The EU-ETS is at a crossroads. For a variety of reasons, which have often been the focus in many debates, the EU-ETS needs reform if it is to remain the cen-

This article reflects the views of the authors and not IETA or Commerzbank.

tral policy instrument for driving down emissions. The EU-ETS's objective is to achieve emission reductions cost-effectively. If we take a long-term approach to this objective, then achieving emission reductions at least possible costs also means that the EU-ETS has a role to play in encouraging investments in low-carbon technologies. The recent focus on short-term considerations have overshadowed the urgency for legislative reform proposals of the EU-ETS, that would provide predictability and long-term visibility to market participants on the direction that the EU is taking. We should not underplay the importance of a political commitment to tackling climate change in a cost-effective manner. The recent example of backloading epitomises the importance of a political engagement to addressing climate challenges. It is ever more urgent to use the remaining political capital until the next European elections, in May 2014, to have an informed and credible debate on the type of reform needed to:

- Strengthen the functioning of the scheme,
- Provide certainty to market participants, and
- Encourage investments to achieve the EU's long-term decarbonisation goal.

What will be the key reforms and ideas that drive the ETS and maintain its central position in achieving the EU's climate goals?

The variety of policy strands can sometimes confuse the bigger picture. The six reform options highlighted in the Carbon Market Report, the green paper focused on a 2030 Climate and Energy Package, and the ongoing backloading proposal are all closely linked to one another. We suggest moving away from the micro view looking at different policy proposals on the table, and have a more strategic approach and consider what is needed for the EU's climate policy in the medium to long-term.

First and foremost, the EU-ETS needs to be restored as the central climate policy instrument for achieving the long-term emission reduction ambition.

Different types of reform to strengthen the role of the ETS are needed; some affecting the design of the scheme itself; others affecting the policy framework surrounding it.

FIGURE 1: EU REDUCTION FACTOR ADAPTATION

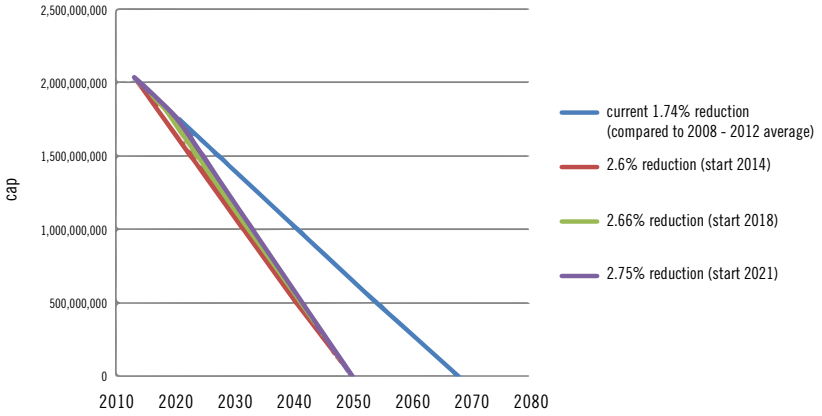
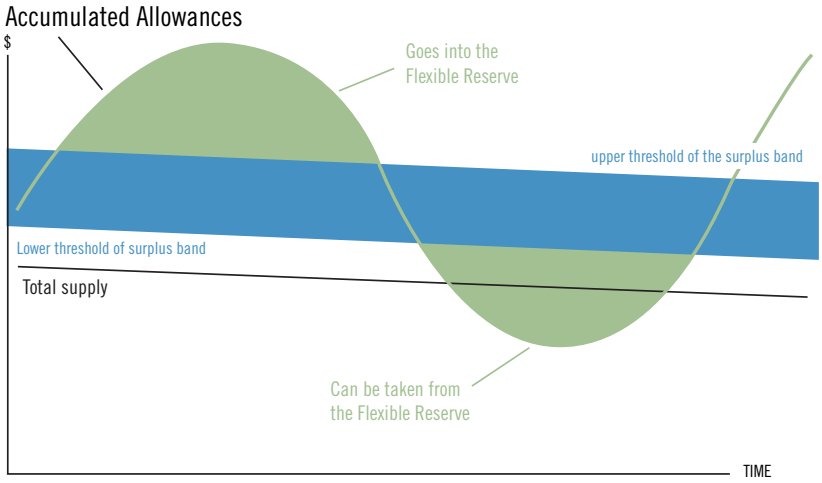


FIGURE 2: A POTENTIAL FLEXIBLE SUPPLY MECHANISM



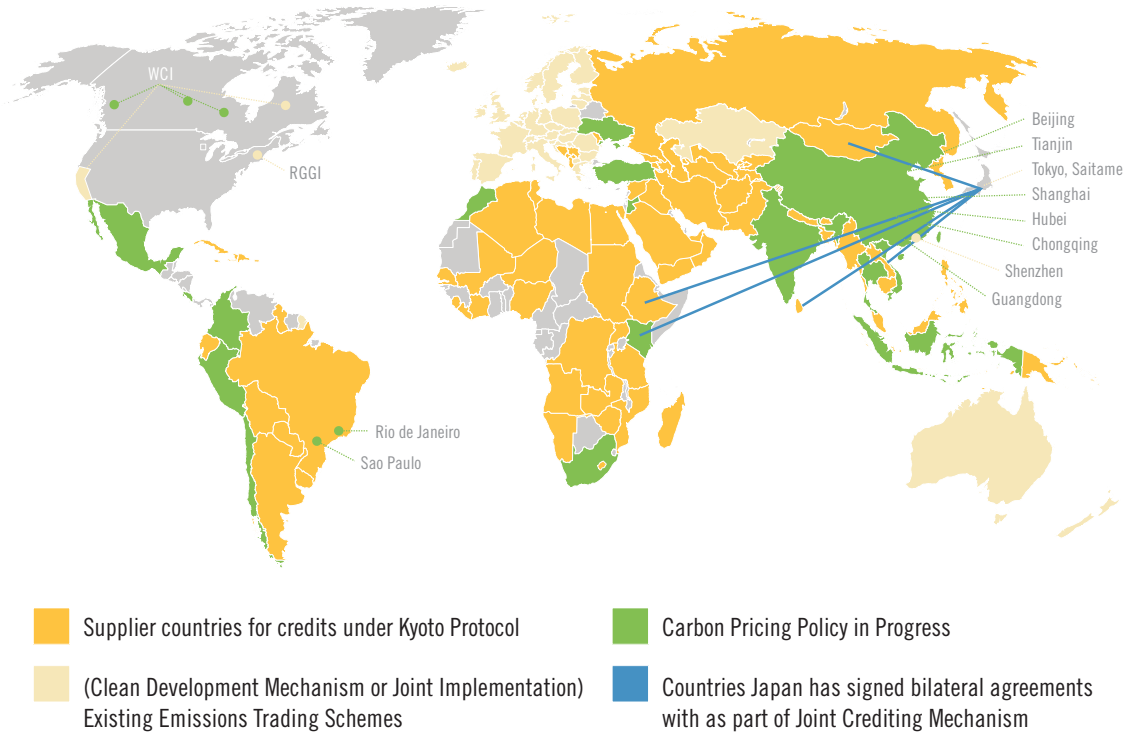
TOTAL SUPPLY REFERS TO THE CAP + INTERNATIONAL OFFSETS. ACCUMULATED ALLOWANCES ABOVE THE UPPER-THRESHOLD OF THE SURPLUS BAND WOULD AUTOMATICALLY TRIGGER THE MECHANISM, WHEREBY THE SURPLUS OF ALLOWANCES ABOVE THE THRESHOLD WOULD GO INTO RESERVE AND (SOME) AUCTIONS SCHEDULED FOR THE FOLLOWING YEAR WOULD BE WITHHELD. THESE CAN LATER BE REINTRODUCED INTO THE MARKET, ONCE THE CUMULATIVE LEVEL OF ALLOWANCES FALLS BELOW THE LOWER THRESHOLD OF THE SURPLUS BAND, AS LONG AS THERE ARE ALLOWANCES IN THE FLEXIBLE RESERVE.

REFORM PROPOSALS AFFECTING THE ETS DIRECTLY

With regards to the scheme itself, it is essential that the trajectory for reducing the total amount of allowances (i.e. the cap) is set in line with scientific recommendations. Setting a cap based on scientific recommendations would ensure the ETS is the main driver for achieving the emission reductions that the EU needs to achieve.

The current trajectory of the EU-ETS cap falls short of reaching the EU's

FIGURE 3: EMISSIONS TRADING AROUND THE WORLD (SOURCE: IETA)



overall long-term commitment of reducing emissions by 80-95% by 2050. On today's trajectory, this objective will not be reached until 2068. Setting targets in line with the long-term goals will influence investment decisions, and therefore the levels of emissions in the medium to long-term. The graph above illustrates the necessary levels of annual reductions in the cap, in order for the EU-ETS to reach zero emissions by 2050, which varies depending on the year when the change in the linear reduction factor is introduced.

Another idea affecting the EU-ETS that deserves further consideration is to change the design of the scheme and allow some flexibility in the supply of allowances.

The fixed supply has recently enhanced the challenges against which the scheme is faced with. The economic crisis has led to lower production levels, and therefore to lower demand for allowances, but the design of the ETS has prevented the supply-side from adapting to these changes. The fixed supply and lower demand has led to a collapse of EUA prices, and put into question the scheme's resilience to extreme economic changes. Many argue that political intervention is required to address the oversupply and low prices, which might not provide sufficient incentives investments required to achieve the longer term EU goal. This discussion has caused divisive reactions. In case it is deemed necessary, instead of political interventions, we would recommend considering introducing some flexibility to the rules, and allowing the supply of allowances to fluctuate in line with extreme changes in demand, according to pre-defined rules that are specified in the ETS Directive.

A quantity-driven threshold could be used to calculate the level of supply that the market can cope with, without putting at risk the achievement of environmental targets. We would recommend a quantity-driven approach where "surplus" allowances would come into a reserve and might be reinserted at a later stage, rather than a price-driven approach, to avoid this proposal becoming too political and antagonising views further. Moreover, low prices of EUAs are not a problem in itself, but in this instance a reflection of the imbalance between supply and demand. Rather than targeting a politically-driven price, the focus should be on addressing the cause of the problem (quantity) rather than the consequence (price). Putting a price on carbon is necessary to encourage emission reductions, but the objective is not to set a specific price - this would best be achieved through carbon taxes. Instead the objective should be to ensure the cap is set at the right level, in line with scientific recommendations.

REFORM PROPOSALS AFFECTING THE POLICY FRAMEWORK IN WHICH THE ETS OPERATES

In addition to changing the scheme itself, changes are also necessary to the policy framework in which the ETS operates. It is essential to restore the centrality of the ETS as the cornerstone instrument. Greater coherence on the different policy tools and targets are needed, which are consistent with the EU's long-term emission reductions. Without greater clarity on the role of the EU-ETS, investments in low-carbon technologies may be left to other, more costly, policies. The EU's 2020 Climate and Energy Framework has shown how an uncoordinated approach to reducing emissions has created different incentives and led to difficulties for the EU-ETS. Setting targets for renewable energy or energy efficiency mandates reductions of emissions, without this being reflected in a lower cap of allowances under the EU-ETS; thus contributing to an oversupply of allowances. Moreover, setting targets at the EU level encourages certain Member States to put in place national measures to reach such targets, which causes disruption of the EU's internal energy market.

We recommend having a better-coordinated approach to the different policies at the EU level, and to use the EU-ETS as the driver for emission reductions.

Ultimately, the EU-ETS needs to link with other jurisdictions, to improve the efficiency of the scheme. The EU-ETS and the use of flexible mechanisms such as the Clean Development Mechanism (CDM) and Joint Implementation (JI), have encouraged an uptake of cap-and-trade schemes around the world. The more such schemes develop and interlink, the greater the pool of abatement options will be, and it will become cheaper to reach climate targets. One of the arguments often put forward today by European policy makers is that the EU cannot do it alone, and that unless large competitive partners also put in place comparative efforts, the EU risks losing out to its competitors. There are high expectations that an international agreement will be reached in 2015, that would create a level playing-field. However, regardless of whether or not such an agreement will be reached, there is an increasing number of carbon pricing initiatives developing in many different jurisdictions.

The EU and the rest of the world

Whilst it is true that the current greenhouse gas pledges are insufficient to keep global temperatures from rising to beyond 2C, there is also increasing evidence of national or regional efforts to price carbon in order to encourage emission reductions. For the time being, these efforts are yet to be recognised internationally, and will hopefully culminate into an international agreement in 2015 in the Conference of the Parties' (COP) meeting in Paris. However, until such agreement is found, a bottom-up approach - whereby schemes emerge in different jurisdictions and contribute to setting a global robust price on carbon - is likely to be the way forward to avoid a rise of global temperatures beyond 2C. The challenge will be coordinating efforts internationally and to recognising different types of carbon pricing initiatives that are emerging.

The EU's leadership may start being questioned as other jurisdictions such as , California, North Eastern US States, Québec, Korea, etc. put in place cap-and-trade. Turning the threat of climate change into an opportunity to develop a low-carbon economy is understood by many parts of the world. Without a strong political engagement and an ambitious reform of the EU-ETS, the EU risks lagging behind its main trading competitors.

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Sarah Deblock is the policy director for European affairs for the International Emissions Trading Association. She manages and directs IETA's European policy initiatives related to the EU ETS and closely monitors the developments regarding regulatory changes to the scheme. She also conducts advocacy work on behalf of IETA's membership, sharing concerns and making suggestions to policy makers in the European Commission, European Parliament and Member States.

Prior to joining IETA, Sarah worked as the parliamentary assistant to Chris Davies, Member of the European Parliament, who was responsible for drafting the Parliament's response to the Commission's proposal to develop a roadmap for developing a low carbon economy by 2050.

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Previously, Ingo was responsible for Interest Rate and Hybrid structuring at Dresdner Kleinwort and worked in commodity structuring and fuels & assets at ENRON. In 2004, Ingo executed the first ever ISDA documented EU allowances transaction and in 2011 the first ever EU aviation allowances transaction.

IETA
INTERNATIONAL EMISSIONS TRADING ASSOCIATION

COMMERZBANK

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EU ETS PRICING AND TRADING TRENDS: IMPROVING OUTLOOK

It is no news that prices for EUAs, the main carbon allowance in the EU's Emission Trading System (EU ETS) have fallen to low levels, averaging over the first eight months of 2013 x EUR/t. The underlying fundamentals point to a further reduction in prices, with too much supply in a market. This started 2013 with an over-supply almost 1.7 Gt of additional carbon credits, and this is only expected to increase further. The simple outlook for prices should just be that prices will go much lower through 2014 and 2015.

The facts though are that such a simple take does not accurately reflect the complexity of the current EU ETS and the political will to intervene in the market. It is this intervention, and the promise of intervention, that drives the possibility that EUA prices are likely to rise in the coming years.

The reform of the EU ETS

A cornerstone of EU climate policy has been the EU ETS and the period of low prices that began post June 2011, coinciding with the slide of the Greek economy from a problem to a crisis. From a peak of 18 EUR/t at the start of June 2011, prices have fallen to be trading through-out 2013 at levels between 3-6 EUR/t. Such prices are a reflection of the market becoming significantly long allowances, due to:

- poor EU economic performance that has helped reduce industrial and utility demands for allowances. In the 2009-2012 period, covered industrial emissions averaged around 100 Mt less per year than the 2008 value. While the state of the economy played a big role, the industrial sector also invested in energy saving and emissions reduction projects with the emissions intensity of output falling over the period.
- heavy investment in renewable power generation, with phase 2 seeing 196 GW (source: EWEA) of renewable generation capacity added across the EU-27.
- the significant use of international offset credits (CERs and ERUs). By September 2013, issued CERs and ERUs amounted to over 2.2 Gt, with the large majority of these credits being bought by EU ETS participants. This means that there are now sufficient Kyoto Protocol offset allowances issued to fill up EU ETS demand to 2020.

The EU has built up an inventory of 1.7Gt of allowances by the end of 2012

Due to this confluence of factors, the EU ETS has built up an inventory of some 1.7 Gt of allowances by the end of 2012. This inventory is expected to worsen in the coming years as all of the above three factors will continue to impact adversely on the supply / demand balance in the EU ETS, peaking around 2015 before starting to recede.

The EC has certainly seen the prevailing low prices as an issue for its policy vehicle, arguing that such low prices will not change investor behaviour and will lead to locking in more carbon intensive investment than compatible with its long-term targets.

In order to bolster prices, the EC has looked at options for reforming its carbon market in the:

- Short-term, with the "back-loading" proposals aimed squarely at influencing prices in the near-term by removing some (900 Mt) of the 2014-2015 cap and releasing them to market at the end of the phase (2019-2020);
- Medium-term, with a number of options looked at that would tighten the current trading phase (2013-2020) over its duration, largely by reducing the volume of the 2020 cap; and
- Long-term, with debate over what 2030 targets should be and how the market could be widened and / or deepened.

In terms of the short-term changes, these will impact on pricing first as they act to immediately remove some supply from the market. At the time of writing, there still remains a question of whether this proposed adjustment will pass the remaining legislative hurdles and be approved by the Council of Ministers.

Getting over the first hurdle, passage through the European Parliament, was difficult, taking two votes and running over the better part of nine months. The difficult passage was largely down to German reluctance to support the proposals due to a government split between the environment (for) and economic (against) ministries.

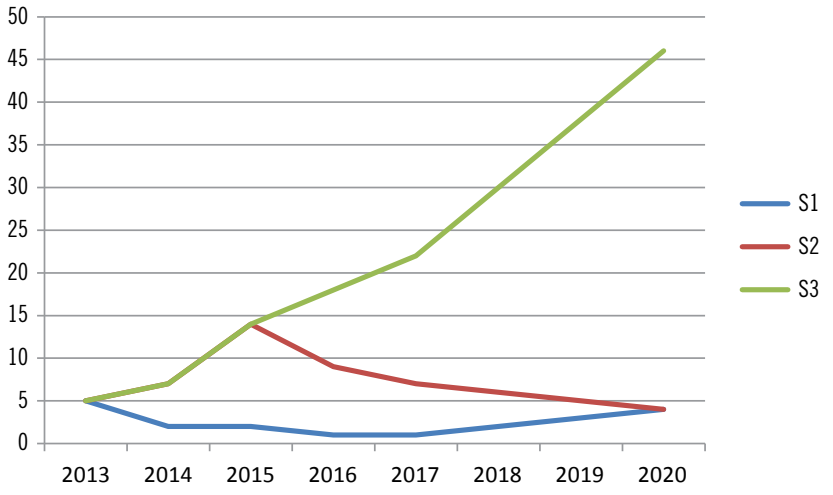
Having finally passed the EU Parliament in July 2013, the bill proceeded up to the Council of Ministers and here the German position was again crucial. While a vote in Council was not going to happen in the summer, it was also not happening in September due to German elections. At the time of writing, the German election outcome was still being negotiated but it would mean that the new government would involve a shift to the center left, so more likely to be supportive of the bill. Therefore, there is a real possibility that the principle of back-loading will be approved by the end of the year.

The remaining uncertainties around back-loading are:

- Exactly what the back-loading proposal will contain in terms of volumes to be back-loaded and what years the volumes will be taken from and put back in. The original proposal was that volumes would be taken out of the 2013 (400 Mt), 2014 (300 Mt) and 2015 (200 Mt) caps. Such a proposal will have to be amended, although taking the volumes out of the last two years (450 Mt) each is still a possibility, provided that the proposed change that would implement back loading is formally agreed in H1 2014. This would likely result in no auctions in H2 2014, which might suggest that fewer volumes will be taken out in 2014 and more in 2015. Pushing the back-loading into 2016 is possible, although it seems like this would further blunt the impact of the policy.
- When the volumes go back in is also up for grabs, with the original EC proposals to put the removed volumes back into the caps in 2019 and 2020. As the back-loading amendment went through the Parliament, there were attempts to require the EC to start putting the volumes back from 2016 onwards, certainly blunting the proposed effect of the policy. While the EC will accept some sort of restriction on re-selling back-loaded volumes, it will aim to push this for as late as possible, and what happens in Council will determine if they have the ability to push this back to 2019-20.
- The back-loading proposals are just the first step on the road of policy change, with the EC looking at structural reform options. These span the range from changing the cap to more aggressive interference in the operation of the price mechanism. While it is early days on this particular road – the EC has recently gone out to consultation on its various options – we initially would think that an option involving changing the 2020 cap would be the one that is most preferred. We still expect to see proposals to increase the ambition of the 2020 level of emissions reduction, which would be operationalised by cancelling the volumes that have been set aside, and possibly some additional volumes from the caps of the years later on in the decade. However, where the EC was once very strong in its defence of allowing the price mechanism to work, this seems to have softened recently, and it appears to be more open to considering proposals for more aggressive intervention in the market.

Regardless of the selected options, the reform timetable is likely to be long and onerous. The experience with back-loading is that it could be three years from original proposal to legal adoption. With the structural proposals being much more ambitious, the timetable will be just as long, if not longer. As such, while we could start to see greater definition of the proposals over the coming year, we expect progress through the EU's two legislative houses to be slow and difficult. The ability of these proposals to highly influence prices over the next two

FIGURE: EUA PRICE FORECASTS UNDER DIFFERENT POLICY OUTCOMES EUR/T



Source: Reuters, Energy Aspects

years will be limited, although if there is a strong legislative signal for cancellation of the back-loaded volumes and more – namely if such proposals start passing legislative hurdles (such as the Environment Committee of the Parliament) – then prices will begin to react upwards.

Outlook

From the above discussion, we see that there are plenty of issues that need to be resolved and that these could be knocked back or changed as they proceed along the legislative path. Political risk in this market remains acute. As such, we see three main potential paths along which EUA prices could proceed over the coming years.

Scenario One (S1): back loading fails to progress through the Council of Ministers. This would put an end to discussions on structural reform for the EU ETS before 2020 and would push EUA prices back to the 2-3 EUR/t level, where they would stay for most of the remainder of the decade.

Scenario two (S2): back-loading succeeds with 900 Mt taken out from H2 2014 to the end of 2015 and reintroduced back in 2016-2020, with 180 Mt being introduced back in each year of that period. Structural reform of the EU ETS has progressed but only for the next phase (post-2020). We feel this is the most likely case. In this case, EUA prices rise to 14 EUR/t by 2015 before trending down to 4 EUR/t by 2020.

Scenario three (S3): back-loading succeeds with 900 Mt taken out from H2 14 to the end of 2015. Structural reform of the EU ETS is passed and the 2020 cap is revised upwards from 20% to a 25% reduction in target, with 1500 Mt of EUAs being cancelled from the phase 2 cap. Under this scenario, EUA prices reach 14 EUR/t in 2015 and increase continuously through the period to 46 EUR/t.

While future price levels are always uncertain, the influence of policy disruption to prices is now acute in the EU ETS. In at least two of the main outcomes we can see happening, the risks are to the upside. However, we can never be sure of the appetites of governments to embark on climate legislation.

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SMOOTH SAILING FOR CALIFORNIA CAP-AND-TRADE

The launch of the California carbon market was watched with much scrutiny worldwide and in the United States. California is the 12th largest economy in the world, and its cap-and-trade program, with a cap over 400 million metric tonnes (Mt) in 2015, is the second largest compliance program in the world. California leaders are committed to setting an example for the nation and for the world of a tightly-run, ambitious emission trading program that would blaze the trail for other states and countries to follow. Given the state of disarray of the EU ETS and the Clean Development Mechanism (CDM), both vastly oversupplied, and the slow progress of climate policy at a U.S Federal level, the bar was high for California's new program. Almost a year after the launch, how is California doing?

Healthy allowances trading

One of the biggest worries for the California market was the potential lack of liquidity on the secondary market. With less than forty-five large emitters (over 500,000 t of annual emissions) in the first compliance period, the pool of potential market participants was fairly narrow, especially since a number of these emitters receive at least part of their allocation for free. Yet trading has proven healthy, with 377,480 t average daily volume year-to-date (YTD) for all vintages together, according data from the InterContinental Exchange (ICE) and Evolution Markets. This adds up to 75 Mt YTD through mid-October, and if the trend continues, will make for just about 100 Mt traded on the secondary market in 2013. Options made up 35 percent of these transactions for all vintages. V13 allowances saw most activity - the most liquid contract, CCA Dec-13 V13 (2013 vintage allowances for delivery in December 2013) total volumes YTD of 46.5 Mt, over 60 percent of all CCA transactions. Yet traded volumes remain thin relative to the European market, where the average daily volume is closer to one percent of the cap.

Participation in the primary market has also been healthy. A total of 64.6 Mt V13 have been auctioned and sold so far, including state-owned and utility-consigned allowances. Future vintages were not so popular in the early auctions, and out of 68 Mt offered for sale over the course of the first four auctions, only 27 Mt have sold so far. But this figure does not reflect the fast growing interest in V15 and V16 allowances. Subscription rates for future vintages went from 46 percent at the February 2013 auction to 100 percent at the most recent auction, in mid-August. Pure play financial participants have stayed on the sidelines, buying only 7 percent of available allowances on average at past auctions. Taken together, emitters from the power sector – IOUs, municipal utilities, power merchants and power importers- dominate, with over half the participants coming from the power sector in any given auction. The oil industry and other industrial sectors contribute about 15 percent of participants each, out of an average 80 participants for each auction.

Offset market lags behind

The offset market has been slower to take off. Thirteen million tonnes Climate Reserve Tons (CRTs) issued since 2005 are eligible for conversion to ARB-eligible offsets, and only a fraction of these traded in 2013 – the offset market size in 2013 was likely below 10 Mt in total. Market activity on the offset market has been held back due to a combination of factors. The buyer liability clause, whereby the regulator places invalidation risk on the purchaser of offsets rather than the supplier, has caused some heartache to risk-averse buyers and produced plenty of friction on the market. The multiple contracts offered to address this issue have helped bring some uneasy buyers to the market, but have also contributed to a market fragmentation, whereby a given credit can fall under four different categories of contract depending on how liability is addressed. This fragmentation and the individual attention required from each contract

mean all offset transactions take place over-the-counter, and California offsets are unlikely to be exchange-traded anytime in the future.

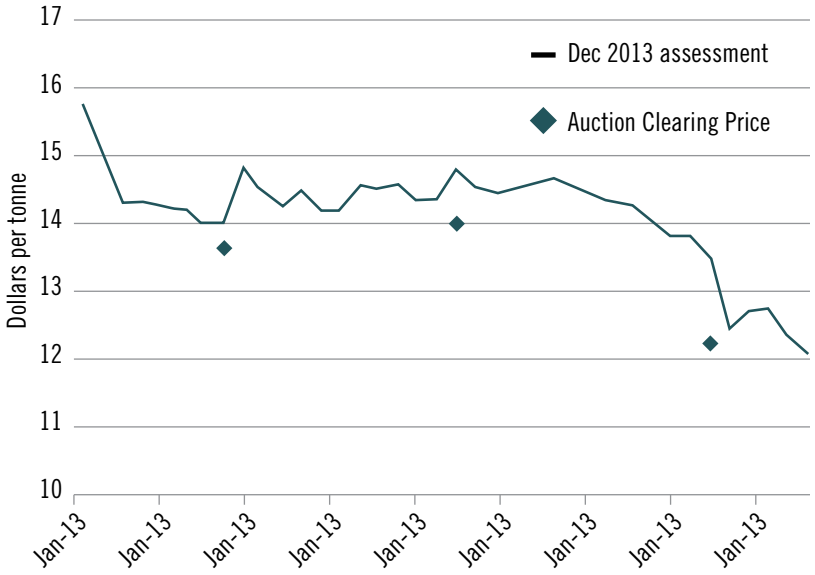
The other main holdup for the offset market was the conversion from 'early credits' to California Air Resources Board (ARB)-approved offset credits. ARB finally issued the first credits eligible for compliance in the California cap-and-trade program in late September: 350,000 t of early action, and another 350,000 t of ARB-compliant credits, all from ODS projects. Getting those projects through the formal approval and conversion process took no less than six months, but the market is hopeful that the floodgates are now open and more eligible credits will flow into the market over the coming months.

Prices

Prices as reported by the Intercontinental Exchange (ICE) have been remarkably stable over the first three quarters of trading in this first compliance year (see Figure 1.). The year opened at a high of USD15.75/t (Dec-13 V13), boistered by the news that the San Onofre Nuclear Generating Station (SONGS) would stay shut down for good. The unexpected closure of California's largest nuclear plant was expected to drive up emissions as carbon-free electricity would be replaced by gas-generated electricity. Yet prices quickly fell to USD14.50 and stayed range-bound between USD14 and USD15 through July 2013. The February auction cleared a few cents below, at USD13.62, while the May auction was more in-line with the secondary market prices, clearing at USD14.00.

Prices dropped a full dollar in August on the back of new inventory data released by ARB that showed historical 2011 emissions were significantly below forecast. In addition, the release of

FIGURE 1. PRICES FOR CALIFORNIA'S DEC-13 V13 CONTRACT. SOURCE: INTERCONTINENTAL EXCHANGE (ICE)



draft regulatory amendments providing for extended free allocation for industrial sectors also contributed to the bearish sentiment. The bear was further reinforced in the August auction, where prices dropped to USD12.22 a ton, also pulling secondary market prices down below the USD12.50/t mark. The low clearing price at the auction was as much a reflection of long-term fundamentals as it was of a cyclical phenomenon in oversupplied markets, where auctions late in the year see lower participation and lower clearing prices as a growing number of emitters have purchased the allowances they need for the calendar year. September saw even more of a fall as some market analysts announced they expected the market's current over-allocation to continue into the third compliance period, providing little incentive for additional emission reductions.

California, overallocated - really?

Could California, one of the most ambitious emission reduction programs in the world, fall victim to the same affliction as its European and Northeastern counterparts? It is possible, but it is not a done deal by any means. The reason California could indeed be overallocated and see prices close to the price floor through 2020 relates to the very ambition of its climate policy. California has implemented a range of overlapping, complementary policies that aim to reduce emissions from the power and transportation sectors in particular. The Renewable Portfolio Standards (RPS), which requires utilities to source 33 percent of their electricity from renewables sources by 2020, is indeed driving meaningful emission reductions through the state, as is the Emission Performance Standard (EPS), which essentially bars utilities from sourcing new electricity from coal (including out-of-state). In the transportation sector, the Low-Carbon Fuel Standard (LCFS) is starting to take a bite out of fuel emissions, while the long term effects of the GHG vehicle standards and incentives for zero-emissions vehicles (electric vehicles in particular) are also starting to be felt. If these policies, together with the dozens other less visible measures to reduce GHG, succeed at decarbonising the California economy, the cap may be more of a safety net than a constraint for years to come.

Yet over-allocation is not a done deal by any means. Tight offset supply, additional demand from California's trading partner, Quebec, and an economic revival could put upward pressure on prices through a combination of rising demand and rigid supply. The lack of readily available low-cost emission reductions means a short market could see rapidly rising prices down the road, albeit most likely kept in check by the price containment reserve.

Legal challenges mostly overcome

A year ago, the future of the California cap-and-trade program was mired with legal challenges and a certain amount of regulatory uncertainty, as the cap-and-trade regulation was due for multiple rounds of amendments, the latest of which is still ongoing. Yet over the course of twelve months, the air cleared significantly, as lawsuits were defeated and the path was cleared for the program to continue as planned. Generally, over the past five years since the publication of the first Scoping Plan in 2008, ARB has proven its resilience to legal challenges and its ability to stay on track. Market participants have signaled they trusted the program was here

to stay as prices and trading volumes for future vintages (V15 and V16) rose steadily over the year, including at the auctions, where bidders wrote a combined check for USD288 million in future vintage purchases. This indicates strong confidence that these permits will keep their value through the second compliance period.

What have we learned from this first year?

In many ways, ARB has been the star of the show for this first year. Two rounds of regulatory amendments, a new online registration and transaction system, auctions and other key market communications have generally been handled smoothly, avoiding any major shock to the market and assuaging some participants' anxiety over the role that the air quality agency would play in the market. Yet ARB has also shown that it was not immune to one of the EU's main weaknesses from a market point of view – constantly updating rules, tweaking and fine-tuning regulations. While most of these tweaks were probably necessary, and many other (conflicting) changes are still called upon by stakeholders, the constant adjustments show that California may be more resilient to legal challenges than to political pressures.

That said public support for climate policy in California remains very high. As of July 2013, 75 percent of voters supported "immediate action by state and federal governments to arrest global warming and prepare for climate impacts," according to the Public Policy Institute of California. Governor Brown plans to run for re-election in the fall 2014 on a platform advocating further emission reductions for California through 2050, and the Air Resources Board is already starting to think about what the post-2020 cap will look like. California's cap-and-trade program looks like it is here to stay, and will remain a centerpiece of the Golden State's climate policy for years to come.

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AUSTRALIA'S CARBON POLICY UPDATE

Australia's emissions trading scheme, the Carbon Pricing Mechanism (CPM) under the Clean Energy Act 2011 (Cth) and related legislation (CPM Legislation), commenced operation on 1 July 2012. The recently elected Liberal National Government has stated that it intends to repeal the CPM Legislation and remove the CPM, effective 30 June 2014, replacing it with its direct action policy (Direct Action). Whether this will be possible remains unclear and is in any case unlikely before July 2014, leaving the current scheme in place to the end of this compliance year. The Government has indicated that it remains committed to a 5% reduction target against 2000 levels. It has commenced a consultation process on the CPM repeal and the Emission Reduction Fund which will be a part of Direct Action policy.

Overview of existing obligations under the Carbon Pricing Mechanism

The CPM was designed to ensure Australia meets its Copenhagen Accord target to reduce greenhouse gas emissions by 5% below 2000 levels by 2020. It was designed to operate for an initial three-year fixed price period (starting at AUD23 per tonne of carbon) transitioning to a flexible price cap-and-trade emissions trading scheme on 1 July 2015. Under the CPM 'liable entities' purchase carbon units from the Government at the fixed price, up to the number of their emissions each compliance year (being 1 July to 30 June). Liable entities may also be eligible to receive freely allocated Carbon Units (FCUs) under transitional assistance packages introduced in conjunction with the CPM. Liability is satisfied through the surrender of eligible emissions units. These include Carbon Units issued or sold by the Clean Energy Regulator, which regulates the CPM, Australian Carbon Credit Units (ACCUs) issued under the Carbon Farming Initiative (CFI) and certain international carbon units. Seventy five percent of units are required to be surrendered by 15 June in each compliance year and the remaining 25% or true up amount by 1 February in the following calendar year.

The Government has released only limited detail on Direct Action

The Government's plan to unwind the CPM

The Government released draft legislation to repeal the CPM on 15 October 2013. In order to repeal the CPM Legislation the Government will need to pass legislation through both the House of Representatives and the Senate. The Government has a majority in the House but will not have sufficient Senators to control the Senate in its own right.

At the time of writing, it appeared likely that the Government will be in a position to secure sufficient micro-party votes, principally from the Palmer United Party, to secure the passage of the repeal legislation through the Senate - although final confirmation of this will remain subject to discussions in coming months between the Government and those Senators-elect.

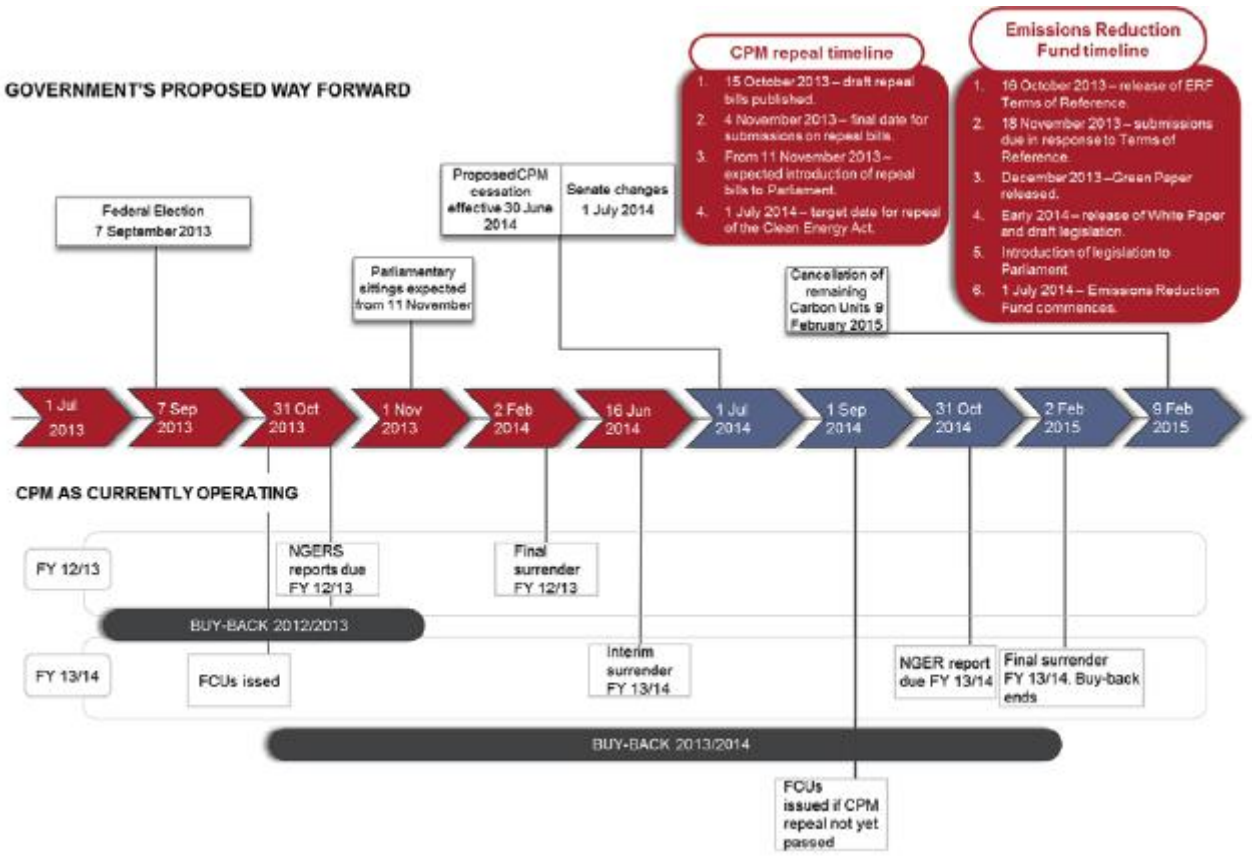
Under Australia's Constitution the Senators-elect will not take their seats until 1 July 2014. If the Government wishes to pass the repealing legislation before then it will only be able to do so with the support of Labor and the Greens, which will hold the balance of power until the new Senators take their seats. They do not support repeal.

Repeal and transitional measures for the CPM

The draft legislation contemplates the substantive elements of the CPM repeal becoming effective as from 30 June 2014, irrespective of whether the legislation is passed before or after that date. Until the repeal process is complete all liable entities will need to continue to comply with their surrender and other obligations under the CPM.

The draft legislation also contemplates that:

- the 2013/14 financial year will be the final compliance year for the CPM;



- the ancillary elements of the CPM compliance regime necessary for the administration of the CPM up to the final surrender deadline will remain during that period;
- the 15 June 2014 and 1 February 2015 surrender deadlines for the last compliance year will remain, although deferred by one day each to 16 June and 2 February;
- no further auctions will be held after 30 June 2014 but if any have been by the time the repeal legislation is passed, auctioned Carbon Units will be cancelled and paid for by the Government;
- all remaining Carbon Units will be cancelled on 9 February 2015, following which no further Carbon Units will be issued;
- transitional assistance under the Jobs and Competitiveness Program (JCP) will still be provided, but only in respect of the 2013/2014 compliance year; and
- both the CFI and reporting obligations under the National Greenhouse and Energy Reporting Scheme (NGERS) will remain, although the legislation for both will be amended to reflect the CPM's repeal.

Implications of the repeal for entities with CPM surrender obligations

As noted above, until the CPM Legislation is repealed, liable entities will need to continue meeting their compliance obligations. These obligations will ensure that some - although likely limited - market activity will continue while the CPM Legislation remains effective. In addition, holders of eligible emission units may also need to manage the following commercial issues:

- Carbon price pass through mechanisms in contracts. Contractual clauses which purport to pass through the carbon price may need to be amended in line with the effective repeal date and the policy which replaces the CPM.These contracts will need to be assessed as to whether there are cost implications until (or after) that date. The draft legislation contemplates an expanded monitoring and enforcement role for the Australian Competition Consumer Commission (ACCC) during the first year after the repeal in order to ensure that cost reductions arising from the removal of the CPM are passed through to consumers.
- Security interests in carbon units. In the event that eligible emission unit prices fall, this may trigger reporting obligations or review event provisions in the financing documents of entities which have given security over the eligible emission units they hold or are expected to receive.

- Windfall benefits. Recipients of FCUs through the JCP and for assistance to coal-fired generators will need to ensure that they sell the units or access the Carbon Unit buy-back mechanism under the CPM Legislation before 2 February 2015, when the mechanism will cease operating, and in any case by 9 February 2015, when remaining Carbon Units will be cancelled.
- Hedging strategies. Some hedging strategies that have been developed to manage carbon risk may need to be re-evaluated in light of the repeal. Businesses should maintain a watching brief on domestic and international carbon market developments.
- Review of CFI projects. The financial viability of existing or planned CFI projects will need to be reassessed. It remains to be seen whether CFI projects will be eligible for funding from the Emission Reduction Fund.

Impacts of the policy change for recipients of CPM transitional assistance

In addition to the issues identified above, recipients of transitional assistance may also face issues that are unique to them given the nature of the assistance provided.

- Coal Sector Jobs Program (CSJP). The CSJP provides transitional assistance to coal mines that have a high fugitive emissions-intensity. The objective is to ease their transition to the introduction of a carbon price. As the CSJP is a contractual rather than legislated assistance program, the Government may be able to terminate the funding agreement it has with each CSJP recipient or reduce the scope of the CSJP at any time.
- Jobs and Competitiveness Program (JCP). As noted above, the draft legislation contemplates the provision of JCP assistance in respect of the 2013/14 compliance year but not for any future years. Recipients of JCP assistance should check any forward Carbon Unit contractual rights or obligations.
- Energy Security Fund. No further FCUs would be issued to eligible coal-fired generators under the Energy Security Fund from 1 July 2014 (see comments above).
- Steel industry assistance. Under the Steel Transformation Plan (STP) the steel industry was to receive cash payments each financial year until the 2015/2016 financial year. Under the repeal legislation no further assistance would be provided from 1 July 2014.

Until the CPM Legislation is repealed, liable entities will need to continue meeting their compliance obligations

New Government policy on climate change - Direct Action

At the time of writing the Government had released only limited detail on Direct Action:

- NGERS and CFI. As noted above, the NGERS and CFI will remain, albeit with some changes. The CFI may be expanded to cover additional abatement project types (including energy efficiency). It is also expected that that some CFI procedural requirements will be streamlined and that some adjustments will be made to broaden methodologies and reduce permanence periods for forestry projects.
- Emissions Reduction Fund. An Emissions Reduction Fund, which the Government has said will become operational by 1 July 2014, will finance the purchase by the Government of least cost abatement (with AUD 300 million, AUD500 million and AUD 750 million allocated over the next three years) through reverse auctions. The Government released White Paper Terms of Reference for the Emission Reduction Fund (TOR) on 16 October 2013. These include limited detail on the policy but the Government has previously said that the Fund may purchase both domestic and international abatement, including Certified Emission Reductions (CERs). It has also foreshadowed that abatement will be purchased from projects for reafforestation of marginal lands, revegetation and soil carbon.
- Baseline and penalty scheme. The Government has said that a key element of Direct Action will be a baseline and penalty scheme which would require participating companies to meet an established baseline. It is likely that NGERS data (to the extent available) will be used to set company baselines. At the time of writing the Government had not confirmed whether any such baselines would be industry- or company-specific.
- Establishment of a Green Army. A Green Army will be mobilised to undertake revegetation projects.

The Clean Energy Regulator will continue to oversee the implementation of NGERS, the CFI, the Renewable Energy Target (RET) and the Government's new policy mechanisms.

Key CPM and Direct Action dates

Comments on the draft CPM repeal legislation were due on 4 November 2013. Comments on the Emission Reduction Fund TOR were due on 18 November 2013, with a Green Paper due to be released in December 2013 and a White Paper and draft legislation due for release in early 2014.

At the time of writing the Government had not confirmed when the CPM repeal and Direct Action legislation would be introduced to Parliament but had said that the CPM legislation will be introduced in the first sittings following the federal election. The diagram below outlines the key CPM repeal and Direct Action dates.

Conclusion

The release of the draft repeal legislation provides a firm indication of the Government's policy intentions for carbon pricing from 1 July next year and public statements from Senators-elect suggest that the Government will win support to repeal the CPM. However, the Government has not yet released any significant policy detail on Direct Action and many micro-party Senators have expressed significant reservations about the policy. This could leave Australia with no CPM and no Emission Reduction Fund or other replacement policy after 1 July next year. Liable entities and other domestic and international market participants should closely monitor the Government's consultation processes for the CPM and the development of the Direct Action policy.

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Martijn Wilder is head of Baker and McKenzie's Global Environmental Markets practice. He is regarded as a legal pioneer in the development of legal mechanisms and regulations underpinning the emergence of international carbon and broader environmental markets. He is ranked as a Star Individual (the highest ranking available) by Chambers Global, is listed among the best lawyers in his field by Best Lawyers Australia 2009 through 2013 and is listed in the International Who's Who of Business Lawyers 2009-2013. He is also listed for Australia, Agriculture & Rural Affairs, Best Lawyers International, 2013. Martijn is Chairman of Low Carbon Australia, a Board Member of the Clean Energy Finance Corporation, Chair of the NSW Climate Change Council, on the governing board of the Renewable Energy and Energy Efficiency Partnership (REEEP) and a Director and Governor of WWF. He is also a Committee Member of the Australian Initiative for Sustainable Aviation Fuels. Martijn is also a Professor of Climate Change Law at the Australian National University and an Affiliate, Cambridge Centre for Climate Change Mitigation Research Department of Land Economy University of Cambridge. In 2012, Martijn was awarded a Member of the Order of Australia in recognition for "service to environmental law, particularly in the area of climate change through contributions to the development of law, global regulation, public policy and the promotion of public debate, and to the community". In 2013 he was awarded the Lawyer's Weekly Law Firm Partner of the Year award.

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CAN THE OBAMA ADMINISTRATION MEET ITS COPENHAGEN GOALS?

On June 25, 2013, President Barack Obama unveiled his Climate Action Plan (CAP). The domestic centerpiece of his plan is a requirement for the US Environmental Protection Agency (EPA) to issue regulations setting CO_2 New Source Performance Standards (NSPS) for new power plants, and to develop a framework for state regulation of existing power plants. Accompanying this plan was a Presidential Memorandum outlining a very aggressive regulatory schedule in an effort to have these regulations in place before the end of the President's term.

On September 20th, EPA met their first deadline and proposed draft carbon pollution standards for all future new coal and natural gas plants. (This is the new NSPS requirement under Section 111(b) of the Clean Air Act). This draft rule proposes separate standards for natural gas and coal-fired units.

- Future natural gas-fired stationary combustion turbines will be required to emit no more than 1,000 pounds of CO_2 per megawatt-hour.
- Small gas-fired turbines with a heat rate less than 850 mmBtu/hr will have a slightly higher emission standard of 1,100 lb CO_2/MWH.
- New coal-fired utility boilers will be required to achieve an emission rate equal to a natural gas-fired turbine (1,100 lb CO_2/MWH).

It is unlikely any new coal plants will be built in the next 10-15 years, regardless of EPA standards

These standards will only apply to new fossil fuel-fired electric utility generating units that generate electricity for sale and are larger than 25 MW. Highly efficient, combined cycle, gas turbines should meet the proposed standard, but in order for coal plants to meet the proposed limits, a substantial portion of their CO_2 emissions will need to be captured (EPA assumes 30-50% capture rate) and permanently stored or used for enhanced oil recovery. "Peaking" plants –such as simple cycle gas turbines - are exempt if they sell less than one-third of their potential electric output to the grid.

Due to the near term projected prices of natural gas, coal and the capital costs of new coal-fired power plants, it is unlikely any new coal plants will be built in the United States within the next 10-15 years regardless of how these proposed standards are finalised. Much longer term, gas prices could increase to levels that would result in new coal plants being economic again (though only if coal plants do not have a CO_2 capture requirement). With the CO_2 capture requirement in the NSPS standards, however, it is unlikely that a new coal plant would ever be built again in the U.S. As a result, EPA's standards for new power plants are not projected to produce any real or substantial CO_2 emission reductions.

An more important issue, however, is what will happen should these standards for future power plants fail be remanded as a result of judicial review. Without effective standards for new power plants, EPA will be unable to issue standards for existing power plants. There are a number of very contentious parts of EPA's new plant regulations, including whether carbon capture and storage (CCS) on coal fired power plants has been "adequately demonstrated" since there are no coal fired power plants operating in the world with CCS. Thus, EPA's new plant regulations could be very vulnerable to legal challenge. This could affect the ability of EPA to develop carbon emission standards for existing fossil-fueled power plants, which is where there is the potential for more significant CO_2 reductions.

Underscoring the importance of the Existing Source Performance Standards (ESPS)[1], the State Department recently released the U.S. Biennial Report, which outlines how "significant additional actions [such as these rules to cut carbon pollution from the power sector] are necessary"[2] in order for the United States to meet its commitment to cut GHGs by 17 percent below 2005 levels by 2020. According to the report, fully implementing the domestic policies outlined in the President's Climate Action Plan will "reduce emissions from 2005 levels by an additional 8-12 percent."[3] Coupled with the 4.6 percent reductions already realised from existing policies,

the upper bound of this projection will put the US less than 1% below its target of 17% reduction. Currently, the power sector is projected to come close to reducing their emissions by 17% in 2020. However, EPA may attempt to require the power generation industry to shoulder much more than their share of the economy-wide reductions.

In the Presidential Memorandum, the President directs EPA to engage in a very involved stakeholder process: EPA is to "launch this effort through direct engagement with States, leaders in the power sector, labor leaders, non-governmental organizations, other experts, tribal officials, other stakeholders, and members of the public, on issues informing the design of the program." The President also dictates that the regulations need to allow for the use of policies that reduce costs, including: "approaches that allow the use of market-based instruments, performance standards, and other regulatory flexibilities."

Finally, as mentioned above, the President dictated a very aggressive implementation schedule:

- September 20, 2013
  – Propose NSPS regulations
- June 1, 2014
  – Propose ESPS regulations
- September 20, 2014
  – Finalise NSPS regulations
- June 1, 2015
  – Finalise ESPS regulations

EPA formally kicked off the stakeholder process with a webinar intended to prepare participants for more in-depth discussions on how to develop New Source Performance Standards. This was followed by a series of conferences hosted by third parties who will act as surrogate conveners of various interested parties. Additionally, EPA will host formal listening sessions in the host cities of their ten regional offices and Washington, D.C..

Ultimately, the Existing Source Performance Standards developed by EPA will not necessarily be used to directly regulate power plants. Instead, each individual State will be allowed to develop their own state-specific or regional plan

[1] Dallas Burtraw of Resources for the Future coined this term to help differentiate the confusing vernacular of "New" Source Performance Standards for sources that are not actually new. / [2] U.S. Biennial Report, page 1, line 13. / [3] Ibid, page 12, line 41

for reducing carbon emissions from power plants inside their borders. Under this regime, EPA will set a target and guidelines, and States will choose how to meet it.

In setting the target EPA has three major decisions to make:

1. How to set the performance standard for state plans?
2. What actions should be required/allowed to demonstrate compliance?
3. What baseline will the standards be compared against?

1) How to set the performance standard for state plans?

When determining how to set the performance standards or guidelines for the states, there are four main options:

OPTION 1: Fuel- and technology-specific efficiency standards based on efficiency improvements that can be achieved "inside the fence line" of each power plant. This option is the most straightforward approach, and reflects how EPA has set these types of standards in the past (typically in plant-specific lbs. per MMBtu or MWh terms). In addition, these standards can include subcategories of plants which can result in different standards by age, boiler type, coal fuel type, etc.

OPTION 2: Standards more aggressive than those based on highly efficient coal-powered units but still within the plant fence line. Standards could theoretically consider technologies such as CCS and/or co-firing of lower CO_2 fuels such as natural gas or biomass. Based on what EPA has already indicated in public comments, CCS is not likely to be used in setting the standard for existing coal units. Further, requiring a switch even in part to a different fuel such as gas or biomass may violate the legal requirement that EPA issue "fuel specific" standards. (which would allow a coal plant to meet the standard while still burning all coal). In addition, EPA is supposed to take cost into consideration when setting the standards and many co-firing applications at existing plants can be expensive.

OPTION 3: Rather than setting limits based purely on technology, set standards for coal boilers based on full switching to the use of lower GHG fuels – for instance, coal to gas-fired boilers. This approach seems the least likely in light of the concerns related to fuel specific standards and cost considerations noted above.

OPTION 4: Establishing a flexible statewide average emissions rate standard or annual emissions standard by state, using one of the options above to calculate the numeric statewide standard. Such a standard would already allow for emissions averaging and trading.

The options described above can be condensed to two different approaches:

1. A Source-Based Approach: Evaluate emission reduction measures that could be taken directly by affected sources (power plants).
- Heat rate improvements
- Fuel Switching or co-firing a lower emitting fuel

1. A System-Based Approach: Evaluates broader portfolio of measures including those that could be taken beyond the affected sources but still reduce emissions at the source.
- Re-dispatch of EGUs based on CO_2 emission rate
- End-use energy efficiency requirements and programs
- Demand-side management programs

It is important to note that any EPA standard or guideline option that goes beyond a plant-by-plant or source based approach is legally untested. Many have argued that EPA cannot establish a standard except on a plant level basis in consideration of the language in Section 111 of the Clean Air Act. On the other hand, some others have discussed the broad flexibility they believe this particular statute provides EPA in setting the standard. However, the boundaries of that flexibility are unknown. Should EPA interpret their authority too broadly, a U.S. court could vacate the whole program.

Where there appears to be much greater agreement is the flexibility that the states have in implementing the standard. In other words, if EPA establishes a plant by plant standard, the states then have the flexibility to allow for emissions averaging, trading, credit for retirements, energy efficiency, or cap and trade programs already in effect (eg. RGGI or California) to achieve the equivalent or greater emissions reductions required by the EPA standards.

2) What actions should be required/allowed to demonstrate compliance?

When contemplating the types of strategies States' may employ to develop their plans it is instructive to consider the myriad of actions States have already taken.

Cap-and-Trade Programs. The Regional Greenhouse Gas Initiative (RGGI) is a regional cap-and-trade program covering the power sector in nine states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. California also has a cap-and-trade program covering its entire economy.

Renewable Energy Standards. According to the Center for Climate and Energy Solutions, 31 states have either a "renewable portfolio standard" (RPS) or "alternative energy portfolio standard" (AEPS) which requires a certain percentage of a utility's power plant capacity or generation to come from renewable or alternative energy sources by a given date.[4]

Retire and Replace Initiatives. Some states, such as Colorado and Minnesota, have initiated programs designed to retire older coal generation and replace it with renewables, natural gas generation, and sometimes new, cleaner coal.

Energy Efficiency/Demand Management Programs. The American Council for an Energy Efficient Economy (ACEEE) has identified twenty-five states that have enacted long-term (3+ years), binding energy savings targets. Several states, such as Texas, require electric utilities to meet specific energy efficiency goals. Others allow energy efficiency to be an eligible resource in their renewable portfolio standards (RPS).[5]

These various programs provide a good sample of the "Toolbox" that the states will have to utilise when constructing their plans to meet the performance standard set by EPA.

The President has set a deadline for EPA to issue a proposal by June 1, 2014, and to establish an final emission reduction goals and provide guidance to the states by June 1, 2015. States will then have 12 months to finalise their compliance plans and submit them for EPA approval. Should a state plan not be submitted or not be approved, EPA will impose their its own program in that state.

3) What baseline will the standards be compared against?

Lastly, EPA will need to determine a baseline against which to compare actions. This decision will be further affected by whether EPA sets a "rate-based" standard or a "mass-based" standard. The baseline of a rate-based standard (how much CO_2 a plant emits per megawatt-hour) will be affected by when major pollution controls were installed on a plant, or when efficiency improvements were undertaken. A baseline for a mass-based standard (how much total CO_2 was emitted in a year) will be most affected by the year or years selected reflecting higher or lower coal fired generation due to overall economic conditions and the level of natural gas prices.

Identifying the policies states and regions can develop is not the challenge when it comes to this program. The challenge facing EPA is setting the level of the emissions reduction target. States are so varied that requiring an equitable percent reduction in emissions (mass-based standard) from each state, or a common emission rate for each state (rate-based standard) simply will not work. EPA has to grapple with setting a baseline target that credits the significant emission reductions that have already occurred or are occurring due to state-specific programs noted above and/or due to large levels of coal plant retirements. In addition, EPA's standards and guidelines need to enable trading programs such as RGGI and California to be fully compliant. Further, EPA needs to take into account that there have been significant emissions increases in some states that have booming economies such as North Dakota.

EPA is currently soliciting states to provide detailed descriptions of the programs outlined above. EPA would like states to identify the amount of emissions reduced or avoided from each program, as well as describe accounting methods for monitoring and verifying these reductions.

[4] C2ES website: www.c2es.org/node/9340
[5] ACEEE website: http://aceee.org/policy-brief/state-energy-efficiency-resource-standard-activity

IETA
INTERNATIONAL EMISSIONS TRADING ASSOCIATION

AEP AMERICAN ELECTRIC POWER

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As the owner of Lawler Strategies, **Tom Lawler** works with corporations, foundations and associations, such as IETA, to craft creative, effective initiatives that meet their federal policy goals. During his tenure in the Senate, Tom served as chief policy advisor on energy and environmental issues for Senator Thomas R. Carper (D-DE). In 2008, Tom was named Director of Public Policy for Natsource, a leading provider of asset management, origination, and advisory services in both global renewable energy markets and carbon emissions trading.

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THE REGIONAL GREENHOUSE GAS INITIATIVE – BUILDING ON SUCCESS

Five years after conducting a pioneering carbon allowance auction, the Regional Greenhouse Gas Initiative (RGGI) serves as a model for how to design an effective and efficient market-based greenhouse gas (GHG) emissions reduction program. As other regions, states, and industries seek to implement their own GHG emissions reduction programs, participating states have demonstrated how to build a program that realizes its environmental goals while also spurring economic growth. In particular, RGGI's success is related the program's design – specifically its focus on the efficient allocation of allowances through auctions, reinvestment of allowance auction proceeds in energy efficiency, clean energy, and other consumer benefit programs, and scheduled periodic reviews and evaluations. By building on this success with a revised emissions cap and other program changes that will reduce projected regional power-sector carbon emissions 45 percent below 2005 levels, the RGGI states demonstrate how GHG reduction programs can be designed so that they both reduce carbon pollution and stimulate economic growth.

A Pioneer in Carbon Pollution Reduction

The first market-based regulatory program in the United States to reduce greenhouse gas emissions, RGGI is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce CO_2 emissions from the power sector. RGGI was first developed in 2005, when, amidst uncertainty on what (if any) federal policy might be implemented to reduce GHG pollution, the RGGI states decided to move forward with an innovative market-based program to cost-effectively stabilize and then reduce carbon pollution, while economically benefiting our states' businesses.

Composed of individual CO_2 budget trading programs in each state, RGGI requires all power plants 25 megawatts or greater to hold one RGGI allowance, issued by the RGGI states, for each ton of CO_2 they emit. These allowances are distributed primarily by auction, as opposed to free, direct allocation.

RGGI States demonstrate how GHG reduction programs can reduce carbon pollution and stimulate economic growth

In choosing to distribute approximately 90 percent of its allowances by auction, the RGGI states help ensure that these allowances are efficiently allocated, preventing any regulated entity from securing windfall profits from an over-allocation of free allowances. This auction design is working – RGGI's independent market monitor has found no signs of anti-competitive conduct over five years of auctions.

In addition to distributing carbon allowances primarily through auction, RGGI is also unique in our focus on reinvesting the proceeds from these allowance auctions in energy efficiency, clean and renewable energy, direct bill assistance, GHG abatement and other consumer benefit programs. Reflecting this focus, the RGGI states made a commitment to invest at least 25 percent of proceeds in "strategic energy programs."

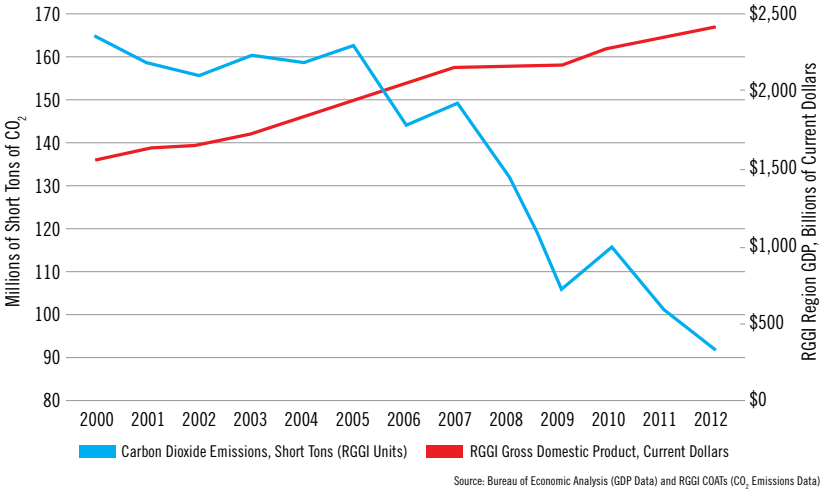
One final way in which RGGI' design is different than other carbon pollution reduction programs was the RGGI states' scheduling of a comprehensive program review for 2012. The states scheduled this program review opportunity to conduct a rigorous and comprehensive evaluation of the program after its first three year compliance period. This evaluation, supported by an extensive regional stakeholder process engaging the regulated community, environmental nonprofits, and consumer and industry advocates, was designed to help the states understand what types of changes could make the program more efficient and effective. In addition, by scheduling the program review after three years, the RGGI secured the flexibility needed to make future improvements to the program.

Lowering Emissions While Spurring Economic Growth

With an emissions cap that stabilized power-sector CO_2 emissions from 2009 through 2014, then reduced emissions by 10 percent over four years, the RGGI states designed a program that was intended to achieve modest reductions in emissions based on projected electricity demand growth. However, the RGGI states have seen our power-sector CO_2 emissions not just stabilize, but fall. Average 2010-2012 power sector regional emissions have declined more than 35 percent since 2005, when the program's Memorandum of Understanding (MOU) was signed, and more than 20 percent since 2008, when the emissions cap was implemented. Moreover, these reductions occurred during a period of economic growth – the RGGI states' regional gross product has increased more than 20 percent in current dollars since 2005. [Figure 1].

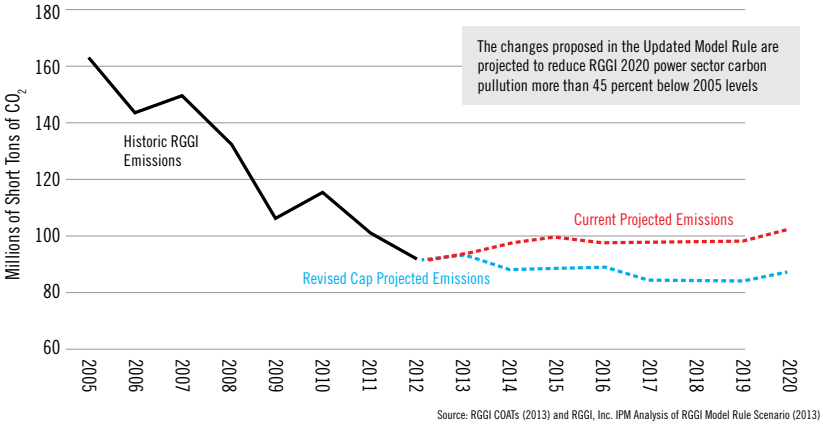
In addition to seeing our power sector emissions decline our economies grew, the RGGI states have also benefited from reinvesting approximately 70 percent of our allowance auction proceeds in strategic energy and consumer benefit programs. These investments in energy efficiency, clean energy, and other initiatives are helping avoid GHG and Clean Air Act pollutant emissions, reducing energy bills, helping local businesses become more competitive, accelerating the development of local clean and renewable energy sources, and spurring job creation in the region. For example, an independent report from The Analysis Group found that RGGI proceed investments generated USD1.6 billion in net economic benefits, put USD1.3 billion in energy bill savings back into the pockets of consumers, and create 16,000 job-years in the region. In particular, RGGI states' investments in energy efficiency have been paying off – not only enabling families and business to reduce their energy bills, but also suppressing overall demand for electricity, helping keep electricity prices stable while reducing the need to import fossil fuels into the region.

FIGURE 1: NINE-STATE RGGI REGION CO2 EMISSIONS AND ECONOMIC OUTPUT (GDP, CURRENT DOLLARS)



Source: Bureau of Economic Analysis (GDP Data) and RGGI COATs (CO_2 Emissions Data)

FIGURE 2: CURRENT RGGI EMISSIONS AND REVISED RGGI CAP EMISSIONS



Source: RGGI COATs (2013) and RGGI, Inc. IPM Analysis of RGGI Model Rule Scenario (2013)

Strengthening a Successful Program

As the RGGI states began our scheduled comprehensive program review in 2010, evidence of the program's success in realizing its environmental and economic goals led the states to consider ways in which we could further improve the program. Following an extensive regional stakeholder process that engaged the regulated community, environmental nonprofits, consumer and industry advocates, and other interested stakeholders, the RGGI states determined that there were areas where the program could be strengthened. Specifically, we determined that there was a significant excess supply of allowances relative to actual emission levels in the region, and that the program would benefit from a more responsive and flexible cost containment mechanism.

To address the excess supply of allowances, lock-in the significant carbon pollution reductions achieved to date, and drive further reductions in the future, the

states proposed a downward adjustment in the 2014 regional CO_2 budget or cap from 165 million to 91 million tons – a reduction of more than 40 percent – along with a further downward adjustment of 2.5 percent each year from 2015 to 2020. In addition, to account for the private bank of allowances held by market participants before the new cap is implemented in 2014, the states proposed additional downward adjustments to the RGGI cap from 2014-2020, which will be based on the size of the private bank of existing allowances. This will help maintain the cap's integrity while still allowing regulated entities to comply with the cap using both "new" auctioned allowances and "old" allowances from the private bank.

In order to create a more responsive and flexible cost containment mechanism, the RGGI states have proposed establishing a new cost containment reserve (CCR) that creates a fixed additional supply of allowances which are only available for sale if CO_2 allowance prices exceed certain price levels (USD4 in 2014, USD6 in 2015, USD8 in 2016, and USD10 in 2017, rising by 2.5 percent, to account for inflation, each year thereafter.) This CCR will prevent a shortage of allowances and corresponding large increases in allowance prices, while maintaining emission reductions over the long term.

An analysis of these and other proposed changes to the program by the RGGI states indicates that they will build on RGGI's environmental and economic success. In addition to reducing projected 2020 power sector CO_2 pollution more than 45 percent below 2005 levels [Figure 2], this analysis projects that the changes will have a minimal net impact to consumers' electricity bills while generating an additional USD2.2 billion (2010) for reinvestment by the states. Overall, the analysis projects that the changes will increase the gross state product by more than USD8 billion, real personal income by more than USD7 billion, and add more than 125,000 job-years.

A Model for Market-based Mechanisms

These future projected environmental and economic benefits, combined with the carbon pollution reductions and economic growth already realized by the RGGI states, are increasingly being recognized by the world's energy and environmental thought-leaders. In fact, new EPA Administrator Gina McCarthy recently praised RGGI, noting its success in "addressing climate change" while building "the economy." In her inaugural speech as EPA Administrator, she said "I know as well as anyone, that when it comes to cutting carbon, there is a lot we can learn from our states… we at EPA want to build on and compliment these efforts already underway."

The cap in 2014 has been reduced from 165 million to 91 million tons - more than 40 percent

As EPA and others seek to emulate the RGGI model for their own carbon pollution reduction programs, they should note three design elements that have been key to RGGI's success—our efficient allocation of allowances through auctions, our reinvestment of allowance auction proceeds in energy efficiency, clean energy, and other consumer benefit programs, and our scheduled program review and evaluation. By incorporating these elements into their own programs, they will be in a better position to build flexible, yet powerful market-based programs that can help them attain their environmental and economic goals.

About the Author(s):

Collin O'Mara serves as Secretary of the Environment and Energy for Delaware Governor Jack Markell. He serves as the chief steward of Delaware's natural resources and oversees implementation of the Governor's goal to make Delaware a leader in the global clean energy economy. Sec. O'Mara has worked to modernize Delaware's energy sector – reducing pollution, stabilizing costs, improving reliability, and seizing economic development opportunities. He negotiated the shutdown of the state's most polluting coal units, facilitated switch-fueling of units, overseen installation of cutting-edge pollution controls, and is facilitating a wide range of renewable energy and energy efficiency projects. He led an aggressive energy efficiency campaign in collaboration with Delaware's Sustainable Energy Utility and local utilities, including implementing the nation's first HomeStar program. Sec. O'Mara serves as Chair of the Regional Greenhouse Gas Initiative Board of Directors and is a member and Past Chair of the Ozone Transport Commission, among other organizations.

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CANADA'S TRADABLE GHG INTENSITY STANDARD FOR OIL AND GAS: THE IMPLICATIONS OF LEADING PROPOSALS[1]

Canada's oil and gas industry is currently negotiating with the governments of Alberta and Canada over new GHG regulations that will be rolled out nationally. Specific proposals are finally emerging that will define the greenhouse gas emission reduction ambitions and costs of nationally important regulations.

In this policy brief, we explain the economics behind the proposals and provide one view on their cost and emission reduction implications. We think it is worthwhile to reveal the trade-offs of the proposals to provide a common information base to inform ongoing discussions. While all proposals on the table will deliver emission reductions at costs that seem reasonable, a 40 per cent intensity standard could strike a good balance. Such a policy could deliver 41 megatonnes (Mt) of compliance in 2020, at an average cost of CAD27 per tonne or CAD0.40 per barrel of oil produced. But most likely a 30/30 proposal will form the basis of the new regulations to be developed.

Issue and Context

The governments of Canada and Alberta face increasing pressure at home and abroad to clean up greenhouse gas (GHG) emissions. The federal government seeks to demonstrate the policy steps it is following to achieve Canada's 2020 GHG emissions target of 17 per cent below 2005 levels. At the same time, controversy over the Keystone XL Pipeline has increased pressure[2] on Alberta and Canada to ramp up policy to help ensure market access. As a result, the oil and gas sector is squarely in federal and provincial regulatory sights, with federal, provincial and industry negotiations ongoing for over a year.

The three proposals on the table[3] have national implications. Canada is firmly on a GHG policy path where federal regulators establish a national performance standard and then provincial regulators design policy that meets the standard or is equivalent. As a result, ongoing negotiations will establish the basis for federal regulations to be applied nationally

While none of these proposals can be verified as definitive negotiating proposals, all proposals pair an emission-intensity improvement with a price ceiling per tonne of carbon dioxide equivalent (CO_2e). Also, the proposals signal a preference by all parties to align with Alberta's Specified Gas Emitters Regulation (SGER). Instrument choice seems to be converging.

So how ambitious are the proposals? Do they provide the sector with the environmental knowledge needed to calm market access waters and Obama's "net effects" test? Do the proposals cast a shadow of doom over industry investment? These are important questions with billion-dollar and global climate implications.

In this paper, we interpret the main design elements of the proposals. Then, we provide economic and emission modelling results and commentary to highlight possible scenario outcomes. We adopt a national policy perspective, assuming the main elements of the proposals will be rolled out across all Canadian oil- and gas-producing facilities.

The Numbers that Matter

All of the proposals pair an emission-intensity improvement target with a price ceiling per tonne of CO_2e (e.g., 20 per cent/CAD20).[4] Together these interact to set the compliance obligation, the marginal incentive to reduce emissions and the cost of the proposal.

The first key element in the proposals is the required emission-intensity improvement. This number defines the total compliance obligation that regulated firms face. It does not in and of itself set the emission reductions that can be expected, but instead interacts with the price ceiling and compliance mechanisms[5] to determine GHGs reduced.

Proposals on the table are purported to seek an intensity improvement between 20 and 40 per cent.

The policy objective of the intensity target is to reduce emissions per barrel of oil produced or units of natural gas by a certain percentage in 2020 relative to a historical base year. The choice of a fixed base year or average of a number of years matters since the emission intensity of the sector is falling in time as new, more energy-efficient extraction and processing techniques are installed. Against 2005 levels, the intensity improvements contained in the three proposals deliver little, given ongoing improvements. But against today's emission performance, a more likely benchmark, the 2020 compliance ask would be significant and could do much to address the Government of Canada's emission gap.[6] However, recent analysis indicates that it is unlikely the sector can achieve even modest intensity improvements by 2020 at costs short of CAD150 per tonne.[7]

This likelihood of high costs for even modest intensity improvements between now and 2020 makes the cost-containment element of the proposals—the dollar per tonne price ceiling—critical.

The dollar value defines the maximum cost of the policy for emitters, containing costs for firms and limiting the potential competitiveness impact of an ambitious GHG target. But while this mechanism provides cost certainty for emitters, it also introduces uncertainty in the quantity of actual reductions the policy will deliver. The proposals enable firms to first seek solutions to reduce emissions at costs less than the per-tonne "price ceiling." In Alberta's SGER, regulated entities can reduce emissions within their facilities, buy emission reductions from other facilities or buy offset reductions from unregulated sources approved as "offsets'" under the SGER. When all abatement opportunities below the price ceiling are exhausted, payments in lieu of emission reductions can be made into a technology investment fund to square up the emitter's compliance obligation.[8] Subsequent investments in GHG reducing projects from the technology fund may or may not lead to additional emission reductions.

TABLE 1: SCENARIOS IN PLAY

Proposal Name	Intensity Standard in 2020 % Reduction from Base Year		Price Ceiling for Technology Fund Payments
	Oil Sands and Heavy Oil	Conventional and Gas	
1. 20/20	20%	20%	$20
2. 30/30	30%		$30
3. 40/40	40%		$40

TABLE 2: NATIONAL GHG AND COST IMPACTS IN 2020

	Compliance (Mt)				Cost Impacts ($2012)		
Intensity (%) / Safety value ($)	Total	Sector	LCDR	Tech Fund	Average Cost (CAD/tonne)	Per bbl. Before tax/royalty*	Total (mln)**
• 20%/$20	21 Mt	4 Mt	10 Mt	7 Mt	CAD17	CAD0.12	CAD348
• 30%/$30	32 Mt	5.6 Mt	15.5 Mt	10.5 Mt	CAD24	CAD0.27	CAD769
• 40%/$40	42 Mt	6.8 Mt	21 Mt	15 Mt	CAD33	CAD0.49	CAD1,370

* OIL COSTS DIVIDED BY OIL PRODUCTION, BEFORE TAX AND ROYALTY INTERACTIONS REDUCE COSTS FURTHER. / ** UNDISCOUNTED COSTS. IN THEORY, THESE 2020 COSTS WOULD BE DEFLATED BY 50 PER CENT TO REFLECT THE TIME VALUE OF MONEY (NET PRESENT VALUE @ 10% DISCOUNT RATE). / SOURCE: IISD MODELLING

The Proposals

Table 1 provides the main elements of the proposals as they have been reported. Note the differentiated intensity standard for oil sands and heavy oil producers that is higher than that required for light oil and natural gas producers. This assumed split reflects our interpretation of the proposals being negotiated.

GHG and Cost Impacts in 2020

Impacts vary across the proposals and are worth revealing to help provide a common information base to inform ongoing discussions. A number of assumptions and caveats are worth noting:[9]

- Policy scenarios cover all oil and gas emitters in Canada, but not the refining sector.
- The compliance year is 2020.
- Emission forecast is 149Mt in 2020.
- Compliance pathways are identical to Alberta's SGER: firm reductions, firm trading, low-cost domestic reductions and technology fund payments.
- Low-cost domestic reductions (Offsets) are from uncovered energy sectors nationally and not from land use, agriculture or forestry. Cost curves from Sawyer, Stiebert and Beugin (2011)[10].
- Intensity improvements in 2020 are achieved against a historical emission intensity in 2011.
- There is a 3 per cent total autonomous intensity improvement between 2011 and 2020. This means that, absent policy, there are reductions happening anyway, and the emitter does not need to work as hard to achieve the intensity standard.

Table 2 provides the compliance and cost implications of the proposals.

The 20/20 proposal would deliver the least amount of total compliance and in-sector GHG reductions of the proposals, with total compliance in the order of 14 per cent below the forecast 2020 sector emissions. Average compliance costs are CAD17 per tonne, or about CAD0.12 per barrel of oil before tax and royalty interactions would lower this cost further. To the extent the compliance payments lower taxes and royalties, the governments of Alberta and Canada both share in this cost.

With more ambition, we see significantly higher costs in Table 2, with costs more than doubling when the 20 per cent intensity standard is increased to 30 per cent in scenario two.

With the 40/40 proposal, we see how fast costs rise as the intensity standard increases, again reflecting the limited abatement opportunities in the sector and the importance of the price ceiling. In this scenario, tech fund compliance is significant and in the order of 46 per cent of total compliance.

Whether or not these "in-lieu" payments to the tech fund deliver future reductions is an open question, with concerns raised that the current proposals provide little incentive to reduce emissions.[11] Still, all proposals set an incentive to abate comparable-to or well-above world-leading GHG policies such as B.C.'s carbon tax at CAD30, California's carbon permits at USD13.12 and European Union permits trading at EUR4.62 (as of October 24, 2013).

While the incentive to abate in current proposals is high, the competiveness impacts are likely low. Under the proposals, a firm's total cost, and hence average cost, is just related to their technology spend. This approach differs markedly with the B.C., California and European carbon-pricing systems, where firms invest in technology up to the point where it becomes cheaper to pay the carbon price and continue to emit. Total costs for the firm are then abatement costs plus the price on remaining emissions (carbon tax or permits from auction).

Conclusion

Taken together, the proposals on the table provide a legitimate basis to deliver emission reductions at reasonable costs, in effect balancing environmental performance and competiveness. What is striking is that the proposals are not that far apart in terms of ambition, and it seems like a compromise can be struck. The negotiations have clearly moved beyond the instrument choice debate about how best to regulate into the more important realm of setting policy ambitions.

In reviewing the proposals, the 40/40 proposal attributed in the press to Alberta combines an important emission reduction ask with a check on competitiveness risk. To the extent this GHG proposal translates into establishing greater social license to operate, profits are likely to be protected, if not increased, as market risks are dampened. Still, we expect the 30/30 proposal will most likely form the basis of a new regulation.

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Dave Sawyer is a leading environmental economist with a track record in solving policy challenges for sustainable development. He is an accomplished communicator, author, facilitator, team leader and project manager, with experience working with various levels of government and industries in Canada and globally. His diverse portfolio of work is focused on energy and climate change, air pollution, ecological goods and services, toxics, waste management and water. He applies his international experience and knowledge to assess regulatory proposals and management instruments, estimate health and environmental benefits, and assess competitiveness impacts. He uses quantitative models and qualitative tools to help governments and industry to address strategic questions and weigh the trade-offs of various policy options and scenarios designed to meet development goals and leverage opportunities for investment and sustainability. He has held positions with Environment Canada, Canada's Commissioner of Environment and Sustainable Development and leading Canadian consultancies. Most recently, he was the International Institute for Sustainable Development's vice-president for climate, energy and partnerships, leading a team of 20 adaptation and mitigation specialists working on low carbon, climate resilient development globally.

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THE FUTURE

CARBON MARKETS
ON THE RISE

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THE ROAD TO 2020: WHAT WILL WE GET

In the aftermath of the Copenhagen Summit in 2009, there was a sense that the diplomatic process had failed. Without the international agreement which many had hoped for, the scenes at COP 15 were of total desolation - This was especially disheartening given what appeared like more and more promising green shoots in climate policy, in places ranging from Acre, in Brazil, to Shanghai, in China, or Johannesburg, in South Africa. Some questioned whether the UNFCCC was still needed?

Since Copenhagen, Parties to the Climate Convention have managed to put in place a number of non-binding voluntary commitments and a set of reporting requirements applicable to all countries. Even the Kyoto Protocol was given a new lease of life, albeit symbolic given the depth of targets and the number of countries in the second commitment period.

On other issues, the discussions under the Convention are now much more at an operational stage than they have been since Copenhagen - whether putting the Green Climate Fund to work, getting the Technology Centers up and running, or starting the process towards biennial reporting by all Parties. The question remains: will all this progress add up to a coherent framework, and specifically, will it impact the development of carbon markets?

The pre-2020 period: a painful process of adjustment

In the current framework, there is a lack of coherence between targets. These Copenhagen "pledge and review" commitments are not comparable and disable the international community from judging global progress on reducing emissions. For example, the hodgepodge of initiatives range from Brazil's deforestation goals to China's emissions intensity targets.

This does not provide the level of stringency and co-ordination that is required to give confidence that international goals are being achieved. It also only provides very light information on the trade and use of carbon units in relation to these commitments. It is too difficult to prevent double-counting of internationally traded units for their emissions reductions.

At the same time, the spread of issues surrounding the core issue of emission reductions has swelled. Climate negotiations are now much more than about emission reductions, but analysing the nexus of climate finance, potential compensation for losses and damages resulting from climate change, sharing the burden of adaptation to climate change of the most vulnerable communities, and enabling access to clean technologies more widely. While negotiators have tried in earnest, the resulting set of decisions in these areas to date has barely scratched the essence of what may be required. These elements will require an agreement in 2015 in which stronger responsibility over reduction targets is taken in order to function effectively, for example through the provision of climate finance to assist developing countries in accessing the financing to impact their growing emissions.

As 2015 nears, the sense grows that the current construct is inadequate for the longer term framework.

The post-2020 regime: docking a new agreement

A post-2020 regime must be understood in the current political context. The previous regime was built at the height of multilateralism, where a stronger international role in combatting climate change was politically feasible. In the current debate, however, there is a far greater reluctance to negotiate both highly centralised compliance and enforcement structures and strict, tight-fitting regimes. While many, including myself, view this as a step backward in international environmental governance, we must adapt to these changing times.

The central role of the UNFCCC has shifted. Rather than providing an overarch-

ing framework for action (as in the case of the international compliance currency of the Kyoto Protocol, underpinning all emission trading systems to date), the UNFCCC will take on a more facilitative role, with a particular focus on building mutual trust and recording progress towards commonly agreed goals. No other institution can provide that role with as much legitimacy. Indeed, recognition by UNFCCC of different climate policy initiatives even if pursued outside of its legal umbrella is still sought by Parties who wish to see the stamp of approval from other nations.

Focusing in on the requirements for a new climate regime, it is not clear how the pre-2020 regime will crossover to a post-2020 regime without a fundamental piece of any longer-term architecture: a common framework for the way future mitigation commitments will be construed, then reported and verified. This was prevalent during the Kyoto regime and, despite contemporaneous hostilities towards international governance, a common accounting standard for measuring emissions remains essential.

Similarly, the standard for emissions reductions should be maintained. The Certified Emission Reduction (CER) formed the currency of emissions reduction internationally and this was in part due to its multilateral, multinational basis. Negotiators of a post-2020 framework will need to counter the impressive array of accounting systems and offsetting protocols through internationally accepted standards.

The rise of these bottom-up approaches calls for a new approach. The FVA and NMM discussions within the UNFCCC are a potential contribution to disentangling this mess and progressively work towards the resetting of an international standard on both emissions (the analogue to the emission unit of the Kyoto Protocol) and the emission reductions (the analogue to Certified Emission Reductions). These approaches have always been seen in the context of top-down (NMM) vs. bottom-up (FVA) conflicting approaches, one seeking undue flexibility (the FVA, as seen by the Europeans), the other one seeking unwarranted centralization (the NMM).

Instead, these approaches could be seen as mutually supportive: a new market mechanism that ensures the recognition of nationally-established emission trading crediting systems, following agreed norms and standards at international level. This is not likely to be significantly different in outcome from an FVA that establishes a common set of rules and procedures for the ex- post accreditation of those same systems under the UNFCCC, ensuring their validity for compliance with any future commitments. However, there are wider accounting and reporting issues in the post-2020 framework that the FVA and NMM can not circumscribe.

Conclusion:

Any agreement in 2015 must take these issues, and many others that could not be tackled in depth here, head-on and find a common pathway forward. For market mechanisms, these discussions are of great importance - carbon is a distinct commodity: it derives its value from regulated scarcity, it is mostly an electronically traded asset, the quality of which is backed only by the quality of the definition, concepts and MRV regulations underpinning the asset itself. Differently constructed carbon assets will not be fungible, will have their validity disputed in different market settings and will result in lower levels of liquidity. An agreement built around agreed targets, common accounting, and international fungibility will provide a strong basis for the post-2020 world. Let's hope that the diplomatic process succeeds this time around.

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Pedro became a Board Member at GET2C in 2012, where he coordinates the policy consulting business. From 2008 to 2011 Pedro was Member of the Executive Board of the Clean Development Mechanism (CDM). Between 1999 and 2011 he provided support to the Portuguese and EU Delegation to the UNFCCC at EU and UN negotiations and acted as lead negotiator for the EU, chairing negotiations on the future of the carbon market under the Kyoto Protocol (Ad Hoc Working Group on the Kyoto Protocol) and the inclusion of CCS under the CDM in 2010 and 2011.

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CHINA'S CARBON MARKET: WHERE NEXT?

Ten years after the UK piloted the world's first emissions trading scheme, China joined the force to explore similar ways of cutting carbon. When carbon first traded in Shenzhen on 18th June 2013, people - including myself - were nervous about whether the price would sustain. In three months, the carbon price has risen from RMB 30 to RMB 90 (11 EUR) per ton[1]. It is still too early to tell why market reacts in this way, and whether current price levels will prevail over the longer term. But it is exciting to witness the efforts to implement a long-lived and functional market.

The newly released "User Guide To Emissions Trading in China"[2] has helpfully summarized lots of details about the Emissions Trading Scheme (ETS) pilots. This paper focuses on a couple of issues affecting the ETS pilot programmes, followed by drawing a map of a national ETS; and finally a discussion of electricity pricing.

Taking the Next Steps:

The Chinese Government is implementing seven ETS pilots. Apart from Shenzhen, others are catching up. Shanghai already has the necessary components in place and is waiting for the right time to commence; Guangdong is rushing to achieve its year-end deadline. Both have published "management measures" earlier this year laying out the rules ETS pilot operation will be based on, such as rewards for accurate reporting and non-compliance penalties. Hopefully there will be more progress in the coming months, though it is understandable that the pilots must deal with a large number of issues at this moment. There are a few things they could spare a moment to look into further.

The seven pilots are significant in size, contributing to 25% of China's GDP, consuming 21% of national energy (see table) and are largely coal-based. Given that half of their emissions will be covered in each pilot, the pilots are forecasted to regulate almost 1 gigaton[3] of carbon dioxide every year from major energy intensive sectors. However, the actual figure is likely to be smaller because electricity-related emissions are counted twice - when they are first produced in the power plants, and when used by large manufacturers or facilities. The pilots need to be transparent on the capped emissions and clear about the additional effect on emissions reduction contributed by ETS.

	2010 Energy Consumption (0000 tce)
Beijing	6,954
Guangdong	26,345
Shanghai	11,201
Tianjin	6,818
Chongqing	7,117
Hubei	11,309
Shenzhen	included in GD
Subtotal	69,745
National	324,939
7 pilots / National	21%

SOURCE: 2011 YEAR BOOK

A couple of pilots may fail to meet the deadline this year. Stocktaking, the process of checking the emissions from 2010-2012, lasted longer than expected. A particular challenge is the ever-changing stock. On one hand, many old installations need to be taken out from the stock in the national wave of improving energy efficiency. However, factories want to delay their shutdown in order to receive some free allowances. On the other hand, the Chinese economy is growing. New buildings, plants and installations are already in the pipeline. New entrants have to be dealt with carefully and innovatively. This special situation places a huge challenge on allocation.

Another worrying thing is that, with a few exceptions, major emitting companies are not geared for managing carbon emissions in-house, and are not currently prepared for trading. They certainly care but are waiting for clearer instruction of government's policies, such as, how many allowances they will get. Although it won't take long for these companies to switch attitude, the regional pilots are too segmented and small, individually, to draw enough attention to the headquarters of big emitting companies who are concerned about their overall business rather than a small percentage in the pilot regions. The question is; how to create influence at the corporate level from local operations, and how to change behaviour in senior management? This is a key success that the ETS has brought to the business world in Europe.

Central Government's Dilemma:

Emissions trading policy remains vital if China is to step onto a lower carbon economic development path. The State Council Work Report, released in March 2013, says that "… [China] will steadily implement the pilot projects to trade carbon emissions, research and establish a national emissions trading system." The current timetable is still to have all pilots operational by 2015 and a national scheme by 2020.

A carbon tax is also under debate. China's Finance Ministry is suggesting a comprehensive environmental tax regime that can tackle pollution, as well as reduce energy use. The National Development and Reform Commission (NDRC) climate change stream still considers carbon trading as a preferred option for China, but is open to discussing how taxes could complement trading.

China needs to invest in a massive programme to build the infrastructure for a nation-wide ETS in the next 3 to 5 years. International cooperation programmes, including from the World Bank and The European Commission, will support this process by adding to existing efforts (such as to build a national registry and GHG accounting methodologies).

At the same time, NDRC will need to think about a roadmap. A recent study[4] commissioned by NDRC looked for answers on to how to roll different pilots into a national ETS. There are two options that might be sensible:

- Keep working on the current ETS pilots, copy them to other administrative regions based on a standardised national guidance from 2016 onwards, and link them all together through a national registry. Each region will derive their emission caps and choose enterprises eligible for the ETS referencing the national target;
- Set the national cap once a national GHG database is established, refine the emissions data from the main sectors such as power, cement, iron and steel etc., and then set the target (could be a cap) for each sector and allocate allowances to the enterprises.

From the regulator's perspective, both options can give them control of the system. The first option is easier to manage in short run. It could take years to establish a national GHG system. NDRC chose to set up geographic ETS pilots first, without a national GHG database, and extend them later. The pilots will decide on covered major energy-intensive companies. But allocations will first take place at the local level and be aggregated nationally later, and therefore tend to be more generous than when centrally administered.

The second option is not practical for the time being, but would be beneficial in the long-run. Accepting a nation-wide or a sector-wide cap is still politically difficult. The NDRC climate change authority would have started this way if they could have persuaded the large energy interest groups to support a vote for the emissions trading. If adopted, it would allow a more centralised approach through a single cap. It should be more cost-effective for enterprises, since they don't have to operate with different rules and standards in multiple regional schemes.

A Coal Cap?

The blueprint of China's ETS could change quickly. It depends on when China will be ready politically and technically for an absolute cap. Although green politicians lobbied quite hard, no compulsory target on energy consumption was put into the 12th Five Year Plan (2011-2015). Neither was any limit on coal consumption. The new Energy Development Plan released in March 2013 however, stated an intentional target on coal use – it should be around 65% of the total energy consumption by 2015.

The political context has escalated since northern China, including the Greater Beijing area and Hebei province and Tianjin, experienced unprecedented air pollution at the beginning of 2013. The pollution places a severe threat to people's health and created public tensions towards the Chinese government. The event triggered government plans to scale down pollution in the long-term. This political will was reinforced by the new leadership in an effort to sustain China's growth in a non-traditional fashion, which has been fueled by large scale infrastructure investment and export-driven manufacturing.

On 10th September 2013, China's State Council announced the "Air Pollution Prevention and Control Action Plan 2013-2017" to significantly improve the air quality over the next five years. The key is to cut coal consumption, increase the use of natural gas and provide financial support to energy efficiency projects.

The Financial Sector

Five years after Lehman Brothers filed for bankruptcy, the world is reflecting

what went wrong and who is to blame. China's financial regulator is concerned about increased potential for liquidity strains. When capital is short, the central bank usually injects liquidity into the banking system. Whether it is sufficiently robust to be immune from future global financial crises and economic stagnation, China is debating itself. And perceptions of the role of the financial sector in the ETS are evolving. Vice Governor Pan Gongsheng of People's Bank of China – the master planner of China's financial market – published an article calling for a market mechanism to reduce emissions based on cap and trade, so as to optimise the role of financial sector.[5]

It isn't surprising that the market is not active at the moment - when carbon first traded in Europe the market was not active either. The Government had to encourage the companies to trade allowances. Of course, greater actions should be encouraged, particularly for those who are running the exchanges. But, realistically speaking, Chinese ETS pilots will not allow futures or derivatives during the pilot phase. At the initial stage, China wants to buy some time for compliance entities to learn. In the meantime, it is important that the market remains patient but also to prove the functionality of financial innovations within the regulatory framework.

Ongoing Reform and the Unsolved Price

The ETS is going to be expanded nationwide from 2016. Linking emission abatement costs to electricity pricing is essential for an effective carbon price, and an issue that has been apparent for some time.

Three types of electricity prices are relevant in this context: feed-in-tariffs (FITs), distribution prices (DPs) and retail prices (RPs). The FIT, plus DP, equals the RP. DP reflects the costs of grid construction and electricity transmission, which is relatively stable. RP has been kept artificially low by the NDRC pricing department to control inflation. The State Grid plays a key role is setting the FIT and controlling dispatch in China. Although the undergoing reform is trying to format one benchmarking FIT, the grid negotiates a FIT with power plants one-by-one – the so called "one plant one price system". In other words, electricity prices are not market-driven.

Power generation companies can negotiate with the State Grid but within very limited bounds. Under the current dispatch system controlled by the Grid and local government, power generators have to sign up to produce a set amount during a certain period of time and FIT.

In the past decade, China has tried to push an electricity market reform and flex the electricity price. The key measure is benchmarking of prices for different provinces or certain regions. This links the coal price with the electricity price and tiered pricing for household electricity.

The reform has been carried out slowly. No timetable has been proposed. Two problems need to be solved going forward:

- Separate the dispatch system from transmission, which are both currently managed by the State Grid and has strong negotiation power over pricing;
- Further price reform, starting from "direct trade" between power generators and large electricity users, aiming to bring more competition to the on-grid price

A Way Forward Under Controlled Pricing

A research team from the State Information Centre (SIC) of NDRC is trying to measure the economic impact and the emission reduction effect of a given carbon price in the power sector. The carbon price is introduced as a shock to increase the cost of consuming fossil fuels. The notion is to provide practical suggestions on how to link electricity prices with carbon price, considering the regulated electricity price system. The UK government is supporting this study and working with SIC.

The SIC designed and compared the impacts of different scenarios based on: the extent to which carbon costs can be passed through the electricity price; which sectors are opened to a flexible electricity price; and where to redistribute revenue from pricing carbon.

The main findings include:

Carbon pricing can reduce emissions effectively even with a controlled electricity price;

The power sector has the largest potential to reduce emissions through replacing low efficient coal-fire power generation, supported by more flexible dispatch system;

Suggest to link carbon-electricity first in the energy sectors, and one option is

to pass about 50-70% of the increased cost to energy-intensive users.

Conclusion

When the seven pilots begin detailing their ETS designs filled with energy and passion, it is possible to lose the big picture or the basics. It is a concern that people may start to forget that the purpose of the ETS is to reduce emissions in the most cost-effective way. A cap is an essential ingredient. Whether it is based on coal or carbon, it should be built on an accurate and transparent data system at the local and central level eventually.

China has options of running an ETS with or without a carbon tax, centralised or decentralised. No matter which path, China needs a guided map to develop a nationwide ETS from the pilots, and builds the right incentives and confidence to enable business. Pricing carbon through an ETS can trigger innovative thinking and doesn't necessarily require systematic change of electricity pricing.

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AN OVERVIEW OF EMISSION TRADING IN KOREA

The Republic of Korea legislated for greenhouse gas emissions trading in May 2012, and the government also enacted the presidential decree in Nov 2012. The Korean ETS is scheduled to start from 1st Jan 2015. The Ministry of Environment (MOE), as a competent authority of the ETS, will prepare the National Allocation Plan and all the related guidelines by June 2014.

Background

Korea emitted 668 $MtCO_2$ of greenhouse gases in 2010, making it the eighth largest greenhouse gas emitter in the world. Also, South Korea is the world's fifth largest oil importer, and it is dependant on foreign countries for 97% of its energy. Furthermore, it has various heavy industries such as steel, cement, automobile manufacturing, shipbuilding, oil refinery, petrochemicals, etc. This energy intensive infrastructure particularly makes Korea vulnerable to external energy events. As a countermeasure, the former president LEE Myung Bak announced "low carbon & green growth strategy" in 2008, which focused on catching "two birds with one stone" - environment protection from climate change, and economic growth through green technology and green investment.

In 2009, Korea pledged its voluntary emissions reduction target – 30% below BAU by 2020 - which was the maximum target that the developed countries, including the EU, had suggested for non-Annex I countries. According to Korean Government estimates in 2009, the BAU emissions in 2020 will be 813 $MtCO_2$ and -30% level will be 569 $MtCO_2$, which means 4% reduction compared to 2005 emission level. In 2011, the Korean government approved the emissions targets at a category level, such as 18.2% reduction from the industrial sector, 26.7% from the energy sector, 34.3% from the transport sector, 26.9% from buildings and 5.2% from the agriculture sector.

Despite the efforts to reduce its greenhouse gas emission using various policies and measures - including promotion of renewable energy and energy efficiency, improvement of buildings and enlargement of public transportation - Korea's greenhouse gas emissions has grown rapidly, which led the government to find the most efficient way to cut its emissions. After several studies and discussion inside the government and with the private sector, Korea decided that an emissions trading system is the more cost-effective way to reduce greenhouse gases with less or damage to society rather than either the "command and control" method or carbon tax.

Commitment period

The Korean ETS system is scheduled to start on 1st Jan 2015. The first commitment period (CP) of the scheme will be from 2015 to 2017, the second CP will be from 2018 to 2020. Future CPs, from 2021 onwards, will be lengthened from 3 years to 5 years.

Scope and coverage

The Korean ETS will cover approximately 500 installations as liable entities with the threshold of 25,000 tCO_2/year. The system includes not only industrial sector such as steel/iron, cement, car and ship building, and refinery, but also includes huge buildings, transport, agriculture, and waste. This threshold will account for about 60% of Korea's total emissions, which is estimated at 450 $MtCO_2$. The scheme also covers all the 6 Kyoto gases such as CO_2, CH4, N2O, PFCs, HFCs and SF6.

Cap setting

The total amount of allowances (i.e. the cap) will be set by the Competent Authority (CA), Ministry of Environment, considering the national emission reduction target; 30% below BAU by 2020. Once the total cap in the nation is decided, the sectoral cap and cap for each liable entity will be followed considering historical emissions, potential reduction ability including green technology, etc.

Allocation

During the first CP (2015-2017), all the liable entities will get their allowances for free. In the second CP (2018-2020), free allocation will be reduced to 97%,

and the remaining 3% will be auctioned to the companies. Up to 90% of total allowances will be distributed for free and more than 10% will be auctioned in CP3 (2021-2025). The National Allocation Plan from the CA will decide the detailed amounts of free allocation and auctions. However, so-called 'EITE' (Energy-intensive and trade-exposed) sectors will receive their allowances for free regardless of the rate of auctioning from CP2. There are three criteria for this exemption in the Presidential Decree;

- Additional production cost increase is higher than 30%,
- Trade intensity is more than 30%, and
- Additional production cost increase is higher than 5% & trade intensity is more than 10%.

The CA will later decide how to divide the sectors and how many sectors there will be. Thus, the division of sectors or sub sectors is one of the red hot issues.

Companies which reduced their emission below their reduction target in the Target Management System (TMS), that has been implemented since 2012, will be able to achieve additional allowances for their "Early Action". This benefit will be allowed only during the CP1 within the limit of 3% of the total allowances.

Liable entities can request an adjustment of their allocation from the CA when they need more allowance due to the foundation or expansion of a facility, production items change, business plan changes and mergers and acquisitions (M&A). The CA can cancel the allocated allowances in the case of decreased total allowances due to a change in the entity's allocation plan.

Governance

The Korean ETS has unique governance regarding cap setting and allocation. The Ministry of Environment was designated as the CA to implement the ETS and set up all the necessary guidelines, including cap setting, allocation, MRV, registry, compliance, offsets, and market stabilization measures. However, the supreme decision-making body is the "National Allocation Committee", chaired by the Minister of Finance. The committee decides and confirms the national allocation plan, market stabilisation measures, policy on offsets, etc. and is composed of vice ministers for environment, industry and energy, transport, agriculture, forest, and the Prime Minister's Office (PMO).

Also, there is an "Allocation Decision Deliberation Commission" to decide the cap and allocation for each company, additional allocation, adjustment and the cancellation of allowances. The commission is chaired by the Vice Minister for Environment and director generals in ministries of finance, industry and energy, transport, agriculture, forest and the PMO. Under the Ministry of Environment, which is the CA, is the Inter-Ministerial Task Force Team, which is set up to prepare the draft cap for each company and to submit it to CA.

This kind of collaboration was designed to facilitate cooperation and harmonisation between the environment ministry and the economy ministries such as ministry of finance, industry and energy, transport, and agriculture. They focus on the consideration of two different viewpoints – environment protection and economic growth – with industries when the climate change and ETS policies are decided.

In the Korean ETS, detailed guidelines and the National Allocation Plan is supposed to be set up by the CA, Ministry of Environment. However, the Ministry of Finance is responsible for building the ETS Basic Plan, including the current status of ETSs around the world, basic direction, prospect of emissions, economic impacts, and so on, because the basic plan needs to consider macroscopic analysis.

MRV & Registry

Liable entities are requested to submit their monitoring report annually to the CA. Since 2012, the Ministry of Environment has been collecting emissions data of about 500 entities through the TMS system. The data is required to be annually verified by the third-party Designated Verification Institutions (DVIs), which will be approved by the CA. Verified emissions must be certified by the CA through the Certification Committee, which is chaired by the Vice Minister for Environment.

The registry - the electronic Korean Transaction Log (KTL) - checks records, and authorises all allowance transactions and changes of ownership. In order to prevent double counting and unfair profit, the CA is required to take measures that include setting up proper guidelines for offsets, and a robust MRV and registry system.

Compliance

Companies are required to surrender their allowances and credits including offsets within six months of the end of each compliance year. This includes the amount of certified emissions, borrowed emissions, offsets, etc. A liable entity which fails to surrender carbon units as much as it was allowed is required to pay three times the average carbon

market price per tCO_2 as a penalty with the maximum of approximately EUR 70/ per tCO_2.

Flexibility mechanisms

In the Korean ETS system, unlimited banking is allowed during the CP and between the CPs. Borrowing allowances is allowed only within the CP with limit of up to 10% and is prohibited between the CPs. Offsets are allowed and the criteria and types of offsets will be determined in guidelines by June 2014.

However, international offsets, which means overseas allowances (e.g. EUAs in EU ETS) or international credits (e.g. CERs from CDM projects), will not be allowed during CP 1 and 2 (2015-2020). The aim is to promote domestic reductions within the boundary of the installation. Domestic offsets which are allowed from the CP1 will include the CERs generated from CDM projects hosted by Korean companies in the territory of Korea. The limit of offsets is 10% of the total allowance for surrender and the restriction for overseas offsets is 50% of the total offsets, which is 5% of the total allowance.

Market stabilisation measures

The Presidential decree on the Korean ETS regulates the details of market stabilisation measures. For these measures, there are three conditions;

- For six consecutive months, the market price is higher than three times the average market price of two previous years,
- For six consecutive months, the market price is higher than two times the average market price of two previous years & average trading volume of one month is more than two times the volume (larger one) of the same month of two previous years,
- Average market price of one month is lower than 60% level of the average market price of two previous years.

In those cases, the CA can take five types of measures as appropriate;

- Additional allocation up to 25% of the reserves,
- Restriction of the offset limit,
- Limitation of borrowing amount,
- Limitation of permit possession (min. 70%, max 150%),
- Temporary price ceiling or price floor.

Linking

The Korean government is not currently considering linkage with other ETSs. However, the Korean ETS Act enjoins a duty on the Korean government to make efforts to link its domestic carbon market with the international market.

Next steps

Based on the Korean ETS Act, the ETS Basic Plan will be released by the Ministry of Finance by December 2013. The National allocation plan is being drafted by the Ministry of Environment and will be finalised by June 2014. The allocation plan will include total cap and allowances of Korea, criteria for allocation, allocation methods such as grandfathering and benchmark, criteria for banking and offsets, etc. Recently, the Ministry of Environment set up ETS Task Force Team to prepare all the ETS guidelines such as terms of references for allocation, MRV, registry, offsets, and market stabilization measures. These guidelines will be announced by June 2014.

Conclusion

During legislating the Korean ETS Act and the presidential decree, there have been strong oppositions from industry and the energy sector. In 2011, the Ministry of Environment had tried to legislate the act which would have commenced in 2013. However, the ministry postponed the year to 2015 due to resistance from business, who insisted that the ETS would weaken the competitiveness of enterprises. Many experts expect that there will be further opposition and complaints from industry during the process to prepare guidelines and allocation plan. However, all the "red hot" issues have been already decided in the process of establishment of the act and the presidential decree, major setbacks do not seem to be appeared.

The Korean ETS will be the first emissions trading system in the non-Annex I countries, and the volume is expected to exceed that of both Australia and California. The Korean ETS is likely to be a catalyst to lead other similar emerging countries to greenhouse gas emissions reduction using market-based instruments in the most cost-effective way.

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KAZAKHSTAN'S DEVELOPING ETS – AN EXAMPLE OF EMERGING CARBON PRICING SCHEMES IN THE EAST

While emissions trading systems are piloted in provinces in China, and South Korea is set to launch its scheme in 2015, Kazakhstan launched its emissions trading scheme on 1 January 2013, making it the first Asian country to do so. The further expansion of countries adopting carbon pricing schemes will send important signals to investors in low carbon technologies, not only in these countries but also globally.

The Kazakh emissions trading system (K-ETS) started with a one-year pilot phase, to be followed by one or two compliance periods up to 2020. The K-ETS has its legal basis in the country's "Ecological Code" – amended on 3 December 2011 – to establish a national market mechanism for the reduction and trading of greenhouse gas (GHG) emissions. Implementing rules and regulations were developed last year and were approved as law on 11 December 2012.

Carbon market support provided by the European Bank for Reconstruction and Development (EBRD) to Kazakhstan started with the delivery of a carbon market options study in 2009. The Bank is continuing its carbon market development support under its Preparedness for Emissions Trading in the EBRD Region project (PETER) since 2012. In the summer of 2013, the EBRD – in cooperation with Kazakhstan's Ministry of Environmental Protection, and in partnership with the International Emissions Trading Association (IETA) – hosted a workshop in Astana for Kazakh businesses on the practical implications of dealing with emission caps.

The start of the K-ETS is an important milestone towards the introduction of carbon pricing, and supports Kazakhstan's pursuit of its Green Economy agenda. It will help Kazakhstan achieve its 5 per cent emissions reduction target below 1990 levels by 2020 under the second Kyoto Protocol commitment period, and its 7 per cent voluntary emissions reduction commitment over the same period. The Low Carbon Development Department within the Ministry of Environmental Protection is primarily responsible for the implementation of the K-ETS, and is being supported by its implementing agency, Zhasyl Damu.

The start of the K-ETS is an important milestone towards the introduction of carbon pricing

The EBRD is supporting the preparation and development of carbon pricing in a number of its countries of operations, including Poland, Ukraine, Russia and Turkey. This article highlights the main developments of the K-ETS along with its rationale, and aims to share the Kazakh experience with countries that are considering carbon pricing schemes in preparation for the Paris climate summit in 2015.

Scope and reach

The K-ETS covers CO_2 emissions of its biggest emitters (that is, exceeding the 20,000 tCO_2/year threshold) in the energy, industry, and coal, oil and gas extraction sectors. The emissions cap for the programme's first year is set at 147 $MtCO_2$, which will be freely allocated to the 178 companies initially covered by the scheme. Emissions covered by Kazakhstan's ETS represent 77 per cent of the country's CO_2 emissions and over half of its GHG emissions. The emissions allocation for the scheme's pilot phase is based on each participant's (non-verified) emissions in 2010, while an allowance reserve is available for new entrants and for the expansion of production at existing installations.

Future allocations are likely to continue to be based on historical emissions data (allocations for 2014 and 2015 will be based on average cumulative CO_2 emissions for 2011 and 2012), but, like in the case of the EU ETS, Kazakhstan is considering a benchmarking approach for the allocation of allowances to the industry sector starting in 2016. Kazakhstan's amended Ecological Code also initiates a domestic offset (DO) scheme.

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Through this scheme, compliance can be achieved cost-effectively by investing in offsets from eligible projects.

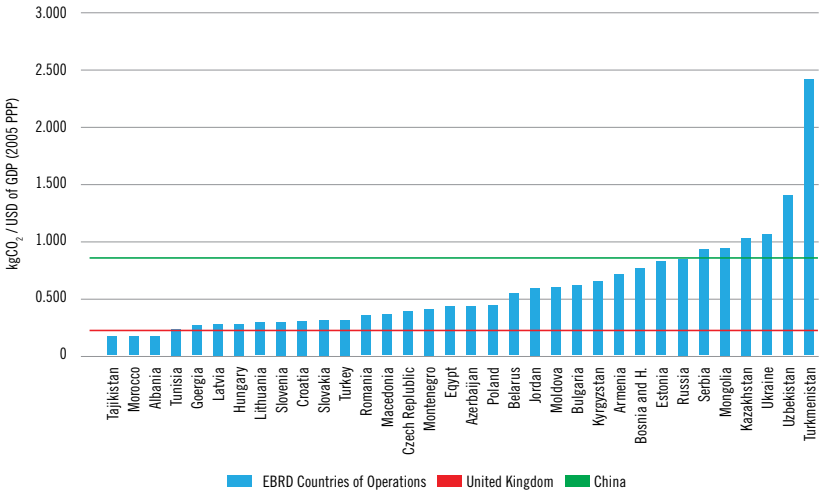
Fast-track approval procedures apply for offset projects in the following prioritised sectors: mining and metallurgy (non-CO_2 gases), agriculture, housing, forestry, prevention of land degradation, renewables, municipal and industrial waste, transport, and energy efficient construction. Transportation and agriculture were originally included in the coverage of the K-ETS, but now look likely to be excluded. These sectors may supply offsets instead. Prioritised project categories have to submit relevant project documentation and a monitoring plan, while for non-prioritised sectors, a project idea note is required and must be endorsed first. There is currently no designated limit on the use of domestic offsets for compliance purposes, while the use of international offsets is not envisaged.

Scope for transition

Kazakhstan remains among the world's most energy- and carbon-intensive economies, despite a sharp fall in carbon intensity since the 1990s (see Figure 1). As set out in the "Strategic Development Plan of the Republic of Kazakhstan to 2020," Kazakhstan seeks to reduce the amount of energy used per unit of GDP and further diversify its economy, which is heavily reliant on primary industries and commodity exports. Investments in renewable energy sources alone have the potential to reduce electricity emissions by as much as 40 per cent.

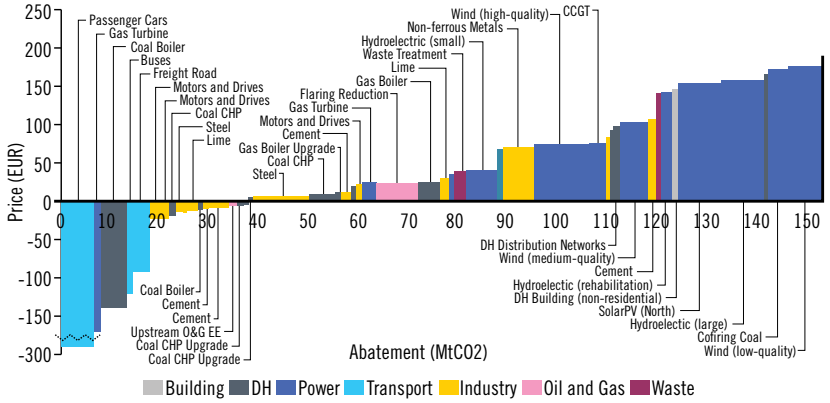
Janet Heckman, EBRD Director for Kazakhstan, said: "Kazakhstan has a vast potential to reduce emissions, including energy efficiency, gas flaring reduction and development of renewable energy resources, and we are looking for opportunities to help by investing in those projects."

FIGURE 1: CARBON INTENSITY OF GDP IN 2011



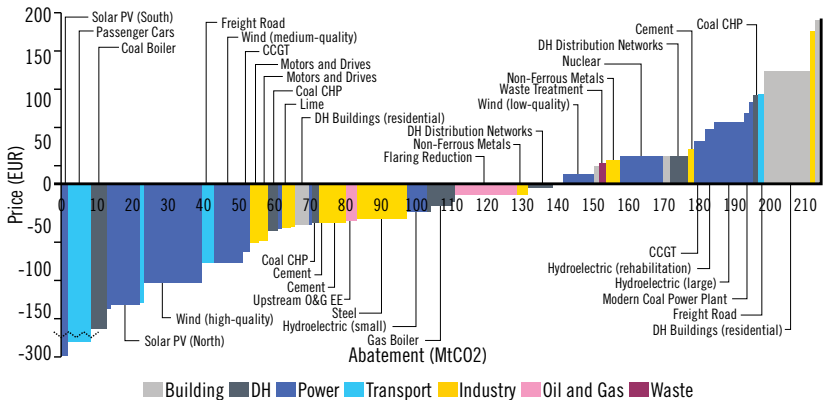
SOURCE: EIA. THE EBRD COMMISSIONED A STUDY IN 2011 TO DETERMINE KAZAKHSTAN'S MARGINAL ABATEMENT COST CURVE (MACC) FROM AN INVESTOR'S POINT OF VIEW. THE RESULTS OF THE STUDY SHOW THAT UNDER A CURRENT POLICIES SCENARIO (OR THE "STATUS QUO POLICY SCENARIO"), INVESTMENTS IN ENERGY EFFICIENCY AND RENEWABLE ENERGY ARE NOT CURRENTLY COMMERCIALLY VIABLE (SEE FIGURE 2). THIS CAN BE EXPLAINED BY KAZAKHSTAN'S ABUNDANT AND LOW-COST COAL RESOURCES AND THE LOW PRICES CHARGED FOR ENERGY. PRICING CARBON HAS THE POTENTIAL TO SHIFT THIS BALANCE; SEE FIGURE 3.

FIGURE 2: INVESTORS' COST CURVE FOR "STATUS QUO POLICY SCENARIO" (2030)



SOURCE: NERA/BNEF, 2011. COMMISSIONED BY EBRD. SEE: WWW.EBRD.COM/PAGES/RESEARCH/ECONOMICS/PUBLICATIONS/COOLAIR.SHTML

FIGURE 3: INVESTORS' COST CURVE FOR 'ENHANCED POLICY SCENARIO' (2030)



SOURCE: NERA/BNEF, 2011. COMMISSIONED BY EBRD. SEE: WWW.EBRD.COM/PAGES/RESEARCH/ECONOMICS/PUBLICATIONS/COOLAIR.SHTML

Each block in Figures 2 and 3 represents a particular technology or abatement measure. Those blocks with a negative price illustrate the potential for commercially attractive investments. For example, without emissions trading or a price support mechanism (such as feed-in tariffs or green certificates) for renewable energy production, investments in hydro and wind power generation capacity are not interesting investment propositions for investors. This changes when adding these policy options to the mix (under an "Enhanced Policy Scenario"; see Figure 3).

Putting a price on carbon will increase the competitiveness of renewable energy projects

Renewable Energy Law

Shifting the balance from fossil fuel-based electricity generation to renewables will take time, but Kazakhstan is also progressing on fronts other than pure carbon pricing to achieve its energy policy objectives. In June 2013 the Kazakh parliament approved a Renewable Energy Law, introducing, for the first time, feed-in tariffs for electricity produced by renewable energy sources. The EBRD's Managing Director for Energy Efficiency and Climate Change, Josué Tanaka, said: "Feed-in tariff legislation is a significant step for the development of renewable energy in carbon-intensive Kazakhstan. The adoption of this new law reflects a close and appreciated collaboration between Kazakh authorities and the EBRD. The next big challenge is building up the infrastructure for renewable energy, on which projects will have to rely. The country needs a lot of investment – from cranes used to install wind turbines, to a modern grid. This is where private investors will have to play a role, and we stand ready to support bankable projects in the sector."

Putting a price on carbon will increase the competitiveness of renewable energy projects, while these projects may also generate carbon credits that can be used for compliance in the K-ETS, if eligible under the country's domestic offset scheme. Details of the domestic off-set scheme remain to be finalised though, including the issue of how to prevent double counting for grid-connected renewable energy projects.

At the same time, pricing carbon will provide incentives for companies covered by the scheme to minimise emissions, and it can be a catalyst for change and innovation, thereby improving the competitiveness of the economy as a whole. Businesses subject to the K-ETS can gain valuable experience in dealing with emission caps, incorporate the cost of emitting CO_2 in investment decisions and – dependent on carbon price developments and an installation's marginal abatement cost curve – benefit from investments in energy efficiency.

Linking

Experiences from the EU ETS have been taken into account by the Kazakh government in designing their emissions trading scheme, which is important in terms of possible linking of the schemes in the future. An example is the Kazakh Monitoring, Reporting and Verification (MRV) system, which is currently being harmonised with the EU MRV system, including procedures and templates. In applying lessons learned from the establishment and implementation of the EU ETS, Kazakhstan has been able to proceed quickly from design to implementation.

However, it remains to be seen whether the objectives that Kazakhstan has set for the operation of the one-year pilot phase of the K-ETS (such as building the registry and MRV infrastructure, data gathering and allowance allocation, and accreditation of auditors) can be met in full, and whether sufficient resources are available to build the necessary supporting infrastructure, including an operational registry.

Pilot phase extension

Companies subject to the K-ETS favoured prolonging the scheme's pilot phase. This proposal has been adopted de facto by the government. The pilot phase is now effectively extended until the end of 2015, allowing for more time to settle the implementation of the system. However, in the absence of penalties for non-compliance, this is unlikely to result in trading activity, which is necessary for companies to gain experience in trading emission allowances.

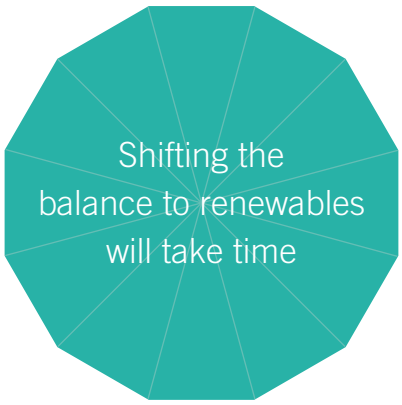
Provided that emerging implementation issues are resolved, and that the scheme leads to a credible carbon price, the Kazakh ETS may become an important

Experiences from the EU ETS have been taken into account by the Kazakh government in designing their ETS

policy tool for Kazakhstan to achieve its Green Economy ambitions.

K-ETS Pilot Phase – Quick Facts

- Covers CO_2 emissions only in the oil, coal and gas production sector, the power sector, mining and metallurgy, and the chemicals industry, with emissions greater than 20,000 tCO_2/year.
- Caps emissions of companies, not installations.
- Allows for unlimited offsetting, with fast-track approval procedures for the following sectors: mining and metallurgy (to the extent not covered by the ETS), agriculture, housing and communal services, forestry, prevention of land degradation, renewables, processing of municipal and industrial waste, transport, and energy efficient construction.
- Banking or borrowing between the pilot and the scheme's second phase is not permitted.



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The EBRD, owned by 64 countries and two intergovernmental institutions, is supporting the development of market economies and democracies. The EBRD is the largest investor in Kazakhstan outside the oil and gas sector and actively supports Kazakhstan's Green Economy agenda through investments in energy efficiency and renewable energy and technical assistance. The EBRD commissioned a study outlining cap-and-trade options for Kazakhstan as part of the Bank's Preparedness for Emissions Trading in the EBRD Region (PETER) initiative. The programme's second phase will focus, in particular, on opportunities for linking the Kazakh ETS with other emissions trading schemes, such as the EU ETS. See www.EBRDPETER.info for further information and status updates.

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MARKET AND NON-MARKET MECHANISMS: A HYBRID APPROACH IN TAIWAN

Although Taiwan emits less than 1% of global greenhouse gas (GHG) emissions, the Taiwanese government has set a voluntary target to return emissions to 2005 level by 2020, and to 2000 level by the year 2025, in order to reduce emissions in line with global efforts. However, modeling based on high GDP scenario projections shows that, after taking existing and additional measures into account, Taiwan will still be over 50 million tons short of its target by 2020. Therefore, Taiwan will need to take additional reduction measures, including further energy efficiency improvement and energy price adjustment, as well as low-carbon technology development. Furthermore, Taiwan will also need to rely on other market and non-market instruments, such as domestic and international offsets, performance standards, carbon fee, and eventually a cap-and-trade system.

Regulatory Progress

In order to meet Taiwan's voluntary target and timeline, the government has developed four legislations for carbon reduction (Energy Management Act, Renewable Energy Development Act, GHG Reduction Bill, and Energy Tax Bill), as the main legal foundation for energy conservation and carbon reduction policies in Taiwan. In 2009, the Legislative Yuan passed the Energy Management Act and the Renewable Energy Development Act. As for the other two complementary legislations, the GHG Reduction Bill is still being reviewed by the Legislative Yuan, and the Energy Tax Bill is still under draft.

Based on the GHG Reduction Bill, Taiwan will implement its domestic reduction policies according to a three-phase framework. First of all, before the Greenhouse Reduction Bill takes effect, project-based reduction with early action credits and offsets will be used by new development projects with reduction commitments under Environmental Impact Assessment. After the Bill is passed and takes effect, mandatory inventory reporting, performance standards for covered sectors, and offset trading will be implemented. And finally, in line with future international developments, Taiwan will set up a cap-and-trade scheme, with a view to eventually link with other schemes around the world.

In September 2010, Taiwan EPA promulgated the rules for early action credits and an offset program in order to set up a domestic scheme for the review and approval of reduction projects and credits. For early action crediting starting from the year 2000, those performing above the benchmark emissions intensities will be eligible for credits. Taiwan EPA promulgated in June 2011 the emission intensities for five major sectors (power, cement, iron & steel, semiconductor, and flat panel – see Table 1), and are now developing intensities for refinery, petrochemical, pulp & paper, synthetic fiber and cogeneration. As for the domestic offset program, the emission reduction projects are based on CDM methodologies and will need to obtain third-party validation, followed by a review by a committee convened by Taiwan EPA. Currently, 167 applications have been submitted, and among them, 6 have passed preliminary review, and 6 projects have been approved. The first early action credits of 178,661 tons were issued in February of this year.

Taiwan will implement its domestic reduction policies according to a three-phase framework

Once the early action crediting and offset projects are approved and the reductions verified, Taiwan EPA will then issue the credits to the project proponents' account in the National GHG Registry, which has been managed by Taiwan EPA since 2007. At this stage, the credits can be used to partially offset emissions from new development projects under environmental impact assessment requirements, or to achieve carbon neutral. Currently, the emission credits management and trading system are almost completed, with the planned operation by the end of this year.

Regulating GHGs as Air Pollutants

Because the GHG Reduction Bill has been debated for over 6 years, Taiwan

TABLE 1: EMISSION INTENSIOES OF DESIGNATED SECTORS FOR EARLY ACOON CREDIONG

Sector (process)		Product			Unit	1st Phase	2nd Phase	
							Existing	New
Iron & Steel	Integrated	Billet			tCO_2e/tBillet	2.170	2.05	1.900
	Elec.Arc	Carbon Steel			tCO_2e/tCarbon Steel	0.455	0.426	0.376
		Stainless Steel			tCO_2e/tStainless Steel	0.492	0.476	0.420
	Rolling	H Steel			tCO_2e/t H Steel	0.184	0.169	0.155
		Hot Rolled Coiled Steel/Plate			tCO_2e/tHot Rolled Coiled Steel/Plate	0.145	0.143	0.140
Cement		Clinker			tCO_2e/tClinker	0.917	0.855	0.821
TFT-LCD TFT-LCD		Glass Substrate under 5th Gen.			tCO_2e/m Glass Substrate	0.308	0.088	0.031
		Glass Substrate above 5.5 Gen.				0.063	0.047	0.038
Semi-Conductor		Wafer < 6”			$kgCO_2e$/cm Wafer	1.440	1.069	0.902
		8” Wafer				1.894	1.321	0.891
		12” Wafer				1.326	0.973	0.642
		12” Wafer (DRAM)				0.697	0.520	0.426
Electrical Generation		Steam Turbine Unit	pre 1999	Coal	tCO_2e/MWH	0.882	0.868	Coal: 0.761 Oil: 0.621 NG: 0.449
				Oil		0.739	0.729	
				NG		0.561	0.545	
			post 1999	Coal		0.835	0.823	
		Combined Cycle Unit	pre 1999	Oil		0.672	Switched to NG	NG: 0.355
				NG		0.424	0.414	
			post 1999	NG		0.380	0.373	

EPA decided to designate the six greenhouse gases under the Kyoto Protocol as air pollutants in May of 2012, in order to facilitate mandatory reporting of GHG emissions by major emitters. Such designation puts the GHGs under the regulation of the existing Air Pollution Control Act in Taiwan. This action is still in line with the first of the three-phase strategy in the GHG Reduction Bill framework (see Figure 1). Taiwan is requiring mandatory reporting of greenhouse gas emissions, starting for 2013.

The first group of designated sources, that is those sectors included in the early action program, were required to report by April 2013. It covers about 240 stationary sources and accounts for about 85% of emissions in the energy and industrial sectors in Taiwan. The second group (with direct emissions over 25,000 tons per year) will need to report by April of 2014.

However, if the GHG Reduction Bill were not passed in the near future, Taiwan EPA plans to proceed with setting performance standards and a carbon pollution fee under the authority of the Air Pollution Control Act. The performance standard would be consistent with the second phase in the GHG Reduction Bill framework. The government has already held several stakeholder consultations on performance standards for the electricity sector, as well as how to set up the rules for collecting the carbon pollution fee. Under either the performance standard or carbon pollution fee, the plan is to allow the designated emitters to use credits from the early action crediting and offset program to offset their emissions. In the interim phase, such flexibility would allow the co-existence of market (offsets) and non-market (performance standard, carbon fee) mechanisms to operate within the same policy framework.

International Linkage

In addition to domestic credits from the early action and offset program, Taiwan will also allow the use of international offsets, and the main standard being considered is the Clean Development Mechanism (CDM). However, since Taiwan is not a Party to the Kyoto Protocol, they cannot directly acquire Certified Emissions Reductions (CERs) from CDM projects in the international market. Therefore, in order to assist the domestic emission sources to acquire international offset credits, Taiwan will initially choose an Annex-I country as an operational base, and use an account under its registry as the central management for all credits acquired abroad. In addition, in February 2013, Taiwan EPA launched the Clean Development and Carbon Management Alliance (Clean Carbon Alliance), a public-private part-

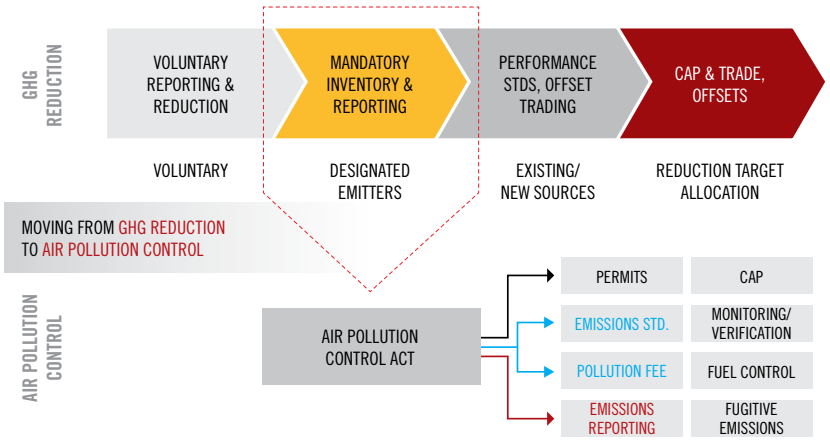
nership to share experiences and promote emission reduction projects domestically and overseas. Such an alliance could be developed into a vehicle for industries to jointly develop overseas projects and acquire international offsets in the future.

Conclusion

Due to its unique political status, Taiwan has not been able to directly participate in the global carbon market. However, Taiwan is working to develop an domestic carbon market, and the early action crediting program will allow domestic industries that have already taken the lead to reduce emissions to be awarded. Taiwan EPA is now building the capacity for domestic mitigation and working towards measurable, reportable, verifiable management for GHG reduction in line with international standards, as well as continuing to push for the passage of the GHG Reduction Bill.

In the meantime, a hybrid approach using both market and non-market mechanisms is consistent with the Framework of Various Approaches (FVA) under negotiation within the United Nations Framework Convention on Climate Change (UNFCCC) as a part of a new 2015 Agreement. Many governments around the world are experimenting with various policy instruments to reduce GHG emissions, and Taiwan is no exception. The current early action crediting program and the planned performance standard with offsets are very similar to the sectoral crediting scheme being discussed for developing countries. Therefore, Taiwan's experiences should be of value to such ongoing development in the UNFCCC and other domestic schemes worldwide.

Finally, in order for individual systems to harmonise into a global carbon market, market mechanisms such as emission trading should still play a key role. It would allow Taiwan to join the global effort to reduce emissions in a cost-effective manner, eventually through linkage with other offset and trading schemes. Ultimately, a carbon price signal, whether it be a carbon fee in the near term or a floating carbon price via emissions trading in the future, would promote domestic reduction and technology innovation in Taiwan, thus contributing to the global effort to mitigate climate change.



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SOUTH AFRICA'S CARBON OFFSET MARKET – DEVELOPMENT AND PROSPECTS

A draft Carbon Tax Policy was released by South Africa's National Treasury in May 2013. This policy paper is the clearest indication yet on the proposed structure and design of any future carbon tax in South Africa. Although the South African government has chosen a carbon tax over an emissions trading scheme, the proposed tax does include a carbon offsetting component.

Structure of the Carbon Tax

The carbon tax is scheduled to commence from 1 January 2015, and will be levied as a fuel input tax on direct, stationary sources of emissions (Scope 1 emissions) at a starting rate of ZAR 120 per ton of carbon dioxide equivalent (CO_2e). The tax rate is set to increase annually by 10%. Waste, agriculture, forestry and other land use (AFOLU) sectors are exempt from compliance requirements under the first phase of the tax, which will run from 2015 to 2019.
The carbon tax makes provision for an offsets allowance to provide covered entities [define] with the ability to buy carbon offsets to contribute to their emissions (and tax) abatement. Depending on the sector in question, the maximum offset potential to be allowed is between 5% and 10% of total emissions, as outlined in Table 1 below. There is however no clarity on the number of entities to be covered, or if emissions thresholds will be implemented in order to determine if all or only some of the companies in the outlined sectors will be liable for the tax.

TABLE 1: OFFSET ALLOWANCES BY SECTOR (%)

Sector	Maximum Offset Allowance (% of Total Emissions)
Electricity	10
Petroleum – coal/gas to liquid	10
Petroleum – oil refinery	10
Iron and steel	5
Cement	5
Glass and ceramics	5
Chemicals	5
Pulp and paper	10
Sugar	10
Fugitive emissions – coal mining	5
Other (including mining)	10

Design of the Offset Allowance

The rationale for an allowance for offsets under the carbon tax is effectively grounded in South Africa's National Climate Change Response Policy. This Response Policy highlights the role that offsets can play in incentivising climate resilient development, climate change adaptation, support for biodiversity conservation and the promotion of wider sustainable development benefits.

In order to support these objectives, Annexure E of the draft Carbon Tax Policy provides some level of detail on the proposed offsetting mechanism. In particular, Annexure E indicates that the offset mechanism is to contain the following key features:

- Only credits issued from South African based carbon offsetting projects will be eligible to be surrendered to reduce a covered entities carbon tax liability
- Only emission reductions certified under the Clean Development Mechanism (CDM), Verified Carbon Standard (VCS) or Gold Standard will be eligible
- All credits used for compliance purposes would need to be retired

The above carbon standards, for use in Phase 1 of the tax, have been proposed due to their global reputation for rigour, credibility and existing infrastructure. This range of standards has also been included to allow project developers to choose the most suitable certification system for their projects. This flexibility to choose should contribute to lowering the cost of certification for project developers and provide support for community-based and sustainable development focused projects.

Eligible Project Types

Although the above standards allow different project types, the draft Tax Policy has proposed limiting the project types from which eligible offsets can be sourced. The draft Tax Policy contains the following three categories: eligible project types, ineligible project types and still to be decided.

Eligible projects are characterised by their potential contribution to sustainable development in South Africa, and the use of offsets from sectors that are not covered by the tax's first phase:

TABLE 2: PROPOSED ELIGIBLE PROJECT TYPES

Eligible Projects
Any project in the AFOLU or Waste Sector
Community based and municipal energy efficiency and renewable energy
Electricity transmission and distribution efficiency
Small-scale renewable energy (up to 15 MW)
Transport sector projects

TABLE 3: PROPOSED INELIGIBLE PROJECT TYPES

Ineligible Projects
All industrial gas destruction projects
Energy efficiency in company owned or controlled operations that are covered by the carbon tax
Embedded or cogeneration of renewable energy for company owned or controlled operations that are covered by the carbon tax
Parasitic electricity usage by fossil fuel based power stations
Fuel switch projects in company owned or controlled operations that are covered by the carbon tax
Energy efficient coal-fired power stations

TABLE 4: STILL TO BE DECIDED PROJECTS

Still to be Decided
Projects under the South African Renewable Energy Independent Power Producer Procurement Programme (REI4P)
Large-scale renewable energy 'Programme of Activities' (PoA) as registered under the CDM (above 15 MW)

TABLE 5: CURRENT CARBON OFFSET PROJECTS IN SOUTH AFRICA

Carbon Standard	Projects In Registration Process (Registered)	Potential Offsets from Registered Projects (tCO_2e/year)
CDM	134 (73)	12,853,480
VCS	3 (2)	739,639
Gold Standard	2 (1)	35,600
Total	**139 (76)**	**13,628,719**

Ineligible projects are mainly characterised by emissions reduction projects that, if eligible under a carbon tax regime, could be argued to offer a 'double incentive' to entities covered by the tax. This double incentive refers primarily to in-house emission execution projects that reduce a covered entity's carbon tax liability, and will thus not be considered eligible for the concurrent sale of carbon offsets.

Industrial gas projects are also proposed to be excluded from the offsets mechanism.

Projects still to be decided upon are those associated with large-scale renewable energy programmes in South Africa. Consultation on the draft Tax Policy is expected to provide a much clearer sense of whether these projects will be eligible under the offset mechanism. The concern raised with regard to large-scale renewables is the potential to effectively flood the market with offsets and thereby crowd out other project types, especially those related to community development, Agriculture, Forestry and Other Land Use (AFOLU) and biodiversity protection.

South Africa's Experience in Carbon Markets

South Africa's participation within global carbon markets has been limited. Carbon projects within South Africa have often missed the opportunities presented by obtaining certification under the CDM, and through that, participation within the European Union Emissions Trading Scheme (EU ETS). There are also opportunities available in the voluntary market.

As of July 2013, 134 CDM projects were undergoing the CDM registration process. Within this number, 73 projects have been successfully registered (including 24 PoAs) and 11 projects have been formally issued with credits. There have been fewer voluntary market projects developed, with three seeking VCS registration and two projects undertaking Gold Standard registration.

The number of projects that have been issued credits in South Africa have resulted in a supply to date of 7.3 million tCO_2e, equalling an average of 810,639 tCO_2e per annum from 2004 to 2012. The dominant project types within this supply of credits relate to industrial gas, fuel switch or energy efficiency projects, while the registered Programme of Activities (PoAs) relate mainly to renewable energy (both large and small-scale) and small-scale energy efficiency.

The predicted demand for offsets (assuming that covered entities utilise their full offset allowance) is expected to be between 25 and 30 million credits per year from 2015 to 2019. In addition, the South African government has proposed a number of ineligible project types from existing credits. Therefore, currently issued South African credits may be insufficient to satisfy the future demand for offsets from entities liable under the carbon tax.

The predicted demand for offsets is expected to be 20 to 25 million credits per year

The potential price for offsets in the South African market has also been one of uncertainty and debate. It has been argued that the offsets could be priced around the effective rate of the tax (between ZAR 12 (USD 1) and ZAR 48 (USD 4.8) depending on the exemptions obtained) or at closer to the marginal tax rate of ZAR 120 (USD 12) per ton[1]. It is, however, safe to assume that the market will price the offsets at lower than the marginal tax rate. Purchasers of credits will need pricing to be lower than paying the tax for offsets to be economical. From the supply side, if the market is undersupplied with offsets then pricing will move towards (but below) the marginal tax rate, and if oversupplied then pricing will move towards the cost to the supplier of bringing a credit to market.

Conclusion and Prospects

A separate discussion paper on the carbon offset mechanism is set to be released by South Africa's National Treasury later in 2013. It is expected that this document will provide increased certainty on the design of the offset component under the carbon tax, particularly in relation to eligible carbon standards and project types. Market trading, whether through an over-the-counter means or the establishment of an exchange, is also still to be determined. The market is currently hanging back and waiting for further clarity, and South Africa can expect a flurry of offset project development to satisfy any shortfalls in potential demand. There is also a degree of uncertainty surrounding the implementation of the carbon tax itself, with the public consultation process on the draft Tax Policy nearing completion. Key components of the tax policy and its related offsets mechanism are subject to change, based on the feedback received.

The next few months are therefore key to the prospects and direction of a future carbon offsets market in South Africa.

(Endnotes)
[1] Assuming a South African Rand to US Dollar Exchange Rate of R1: US$10

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Camco Clean Energy is a leading climate change and sustainable development company, with operations in China, North America, Africa and Europe. We have a 20-year track record in project development, technical delivery and policy development, working with local industry, multinational companies, donors, governments and regulatory bodies. Camco Clean Energy has worked on the African continent for over 20 years, with the company's founders collaborating in the renewable energy sector in Southern and East Africa in the 1980s.

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TOWARD A CAP ON THE CARBON EMISSIONS OF INTERNATIONAL CIVIL AVIATION: ONE STEP FORWARD IN 2013

The civil aviation sector, compared to countries, ranks as a top-ten emitter of carbon dioxide. Its emissions are expected to quadruple in future years. Its contribution may be even greater if its emissions are found contribute to cloudiness and thereby aggravate warming. But the question of how to address emissions from flights between two different countries ("international civil aviation") has vexed the UN Framework Convention on Climate Change since the mid-1990s, and in 1997 the UNFCCC Conference of the Parties referred the issue to the International Civil Aviation Organization (ICAO).[1]

On October 4, 2013, after more than 15 years of wrangling, the 191 member states of the ICAO General Assembly adopted a resolution to develop a global market-based measure (MBM) to cap the carbon emissions of international flights, world-wide, starting in 2020, as part of a basket of measures to address aviation's carbon pollution.[2] The resolution sets a three-year timetable (2016) for finalizing the details of the global MBM. The resolution also seeks to limit the ability of any nation to apply its own MBM to international flights.

The Upside

ICAO's resolution launches a process that could yield the world's first cap on the carbon emissions of an entire sector. The aviation industry was deeply involved and has announced its commitment to see the process through. The text asks ICAO's 36-member Executive Council, "with the support of member States, to finalise the work on the technical aspects, environmental and economic impacts, and modalities of the possible options for a global MBM scheme, including on its feasibility and practicability, taking into account the need for development of international aviation, the proposal of the aviation industry and other international developments, as appropriate, and without prejudice to the negotiations under the UNFCCC."

The resolution also calls on the Council to organise seminars and workshops, identify major issues and problems, and make a recommendation on a global MBM scheme, including a means to take into account special circumstances and respective capabilities, and report the results of this work for decision by the 39th Session of the Assembly, currently slated for 2016.[3]

The resolution thus constitutes an important step. For nearly two decades, nations had been unable to agree on how to allocate to any particular nation the emissions of flights between that nation and any other. Among the eight options considered by the UNFCCC's Subsidiary Body on Scientific and Technological Advice (SBSTA) as far back as 1996 were: attributing the emissions to the departing state, to the state of the vessel's registry, to states based on the citizenship of the passengers, and to states based on the citizenship of cargo owners. The UNFCCC Parties rejected one option, that of attributing to each state those international aviation emissions that occur in that state's sovereign airspace. Such an approach would have created an administrative nightmare while leaving unattributed emissions occurring over the high seas.[4] And then the UNFCCC (via Article 2.2 of the Kyoto Protocol) sent the issue to ICAO.

ICAO also was unable to agree on a methodology for limiting these emissions. So, a decade later, the European Union decided to augment its emissions trading system (EU-ETS) by bringing under EU-ETS aegis all carbon emissions of all flights landing at or taking off from European airports – including flights between the EU and third countries.[5]

Many objections followed. U.S. airlines sued to stop the ETS for aviation. They lost in court,[6] but did manage to obtain

enactment in 2012 of a law giving the Secretary of Transportation authority to bar U.S. carriers from participating in the EU-ETS.[7] The law also requires the Secretary to hold the U.S. airlines harmless – which he could do by imposing retaliatory penalties on European airlines, and transferring the money to the U.S. carriers.[8]

In late 2012, the ICAO Council launched a High Level Group on Climate Change to try to bring a swift conclusion to the issue prior to the September 2013 session of the ICAO Assembly. In response, the EU "stopped the ETS clock" for one year for flights between the EU and third countries.[9]

The Downside

In July 2013, as the next session of the Assembly loomed, the EU offered to trim its ETS to sovereign airspace, if the Assembly (a) formally recognised its right to so apply its ETS, and (b) adopted a serious timetable for a global MBM. Many states informally indicated that the Chicago Convention on Civil Aviation, ICAO's parent treaty, affords states the unfettered right to implement MBMs within their sovereign airspace. But given the opposition of some countries to the proposition that the EU could enforce the ETS within its sovereign airspace, the EU pressed for explicit language in the resolution.

This insistence became a rallying point for many nations' opposition to the EU ETS. In a bid to line up votes, the EU acceded to a request by the Africa Group for text stating that such MBMs should exempt as "de minimis" all flights to and from states whose flag carriers constitute less than 1% of global revenue-ton-kilometers.[10] This would exempt all flights between the EU and Africa. But the US opposed the "de minimis" language, arguing that it exempted too much. Informal analyses indicated that the exemption would exclude flights to and from more than 140 nations, constituting roughly 1/3 of emissions to and from Europe, and roughly half of all international aviation emissions if applied globally.

As the Assembly's second week opened, Argentina, Brazil, China, Cuba, Guatemala, India, Islamic Republic of Iran, Pakistan, Peru, Russian Federation, Saudi Arabia, and South Africa argued that no State may impose its MBM on international flights of other nations' flag carriers without the agreement of those other nations.[11] With the US opposing the 1% de minimis, and the EU unable to come up with a better offer to keep the Africans on their side, a new proposal emerged that combined the mutual-agreement provision with the 1% de minimis provision.[12] In dramatic and unprecedented votes on the next-to-last day of the Assembly, the new proposal won a huge majority.[13]

Then this majority sought further concessions from the many supporting the global MBM (the US, the EU, and a some Latin and Asian countries). The majority demanded that a global MBM be explicitly based on the UNFCCC principle of "Common but differentiated responsibilities" (CBDR), which in their view meant that industrialised countries (and their flag carriers) should reduce emissions first, while developing countries (and their carriers) did so later.

At that point the meeting seemed headed for breakdown. But the industry, fearing that a failure to adopt the overall resolution would leave it vulnerable to a patchwork of national and regional MBMs, intervened. It made an impassioned plea for the Assembly to launch the global MBM based on principles that it had developed.[14] It reminded delegates that industry's license to grow depends on its ability to confront the climate challenge without creating market distortions. It urged the Assembly to premise a global MBM on the Chicago Convention principles of non-discrimination and fair and equitable opportunities. States then struck a compromise that, in an annex, melds CBDR, special circumstances and respective capabilities, non-discrimination, and fair and equitable treatment.

The Outlook

That the Assembly nearly broke apart should not surprise seasoned climate negotiators. But it illustrates the challenge of negotiating an MBM to cap aviation emissions at 2020 levels. That is because while carbon neutral growth from 2020 is a relatively small burden for carriers serving primarily mature markets, a 2020 cap confronts carriers serving fast-growing markets with a large and growing emissions gap. Analyses indicate that a well-designed MBM should easily meet the overall goal.[15] Given an estimated emissions gap of 13-20 billion tonnes, Bloomberg New Energy Finance (BNEF) finds that existing carbon units could cover as much as 20-30% of the gap. Assuming stringent environmental integrity constraints on future offsets, Environmental Defense Fund (EDF) modeling finds that the remainder could be filled at costs ranging from USD7/tonne in 2015 to USD40/tonne in 2050 – less than one half of one percent of industry revenues.[16] Other estimates indicate that the full cost of carbon would

only add USD32 to the price of a tonne of jet fuel, which is currently trading at slightly over USD950 (assuming a carbon price of USD10/tCO_2). This is well within the noise of fuel price fluctuations over the last few years, and works out at less than USD8 per passenger on a flight from London to Singapore.[17]

But finding an equitable approach will not be easy. The search for that approach can and should build on important work already undertaken by ICAO and by ICAO-convened experts.[18] The Assembly reaffirmed ICAO's goal of increasing efficiency by 2% per year, although historical efficiency improvement since 2000 has been slightly below this at around 1.7% per year, and has been swamped by the growth in air traffic. ICAO must also engage the aviation industry[19] and NGOs to find sensible tools for ensuring environmental integrity of offsets and for achieving environmental goals while averting discrimination and preserving fair and equitable opportunities. Given its market expertise, business organisations such as the International Emissions Trading Association (IETA) could play a crucial role in helping complete the work in ways that support a political consensus among ICAO States to agree and adopt a global MBM in 2016. The climate demands no less.

(Endnotes)

[1] See "A New Flight Plan: Getting Global Aviation Climate Measures Off the Ground" (2012), www.edf.org/sites/default/files/A_New_Flightplan_report_Feb2012.pdf / [2] See www.icao.int/Meetings/a38/Documents/WP/wp430_en.pdf. The basket includes a CO_2 standard for engines, improvements in operations and technologies, and sustainable low-carbon biofuels. / [3] While the Assembly meets triennially, ICAO rules allow for extraordinary meetings. NGOs have asked ICAO to hold the 39th Assembly in 2015 to adopt the global MBM. / [4] The history of the UNFCCC and ICAO pre-2013 treatment of aviation climate pollution is summarized in T. Johnson et al., "A New Flight Plan: Getting Climate Measures for Aviation off the Ground" (Transport and Environment 2012), www.edf.org/sites/default/files/A_New_Flightplan_report_Feb2012.pdf. / [5] Directive 2008/101/EC, amending Directive 2003/87/EC. The EU legislation expressly indicated that if ICAO did agree a global approach, the EU would reconsider. / [6] Judgment of the European Court of Justice (Grand Chamber), 21 December 2011, in Case C 366/10, in ATA et al. v. Secretary of State for Energy and Climate Change, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:62010CJ0366:EN:HTML and http://ec.europa.eu/clima/news/docs/2011100601_case_c366_10_en.pdf. / [7] European Union Emissions Trading Scheme Prohibition Act of 2011, Public Law 112–200, 126 Stat. 1477, November 27, 2012, at www.gpo.gov/fdsys/pkg/PLAW-112publ200/pdf/PLAW-112publ200.pdf. / [8] See 49 U.S.C. 41310 and related measures, originally codified as the International Air Transportation Fair Competitive Practices Act (IATFCPA) of 1974. The economic logic of the resulting trade war is dubious given that many U.S. carriers have entered into revenue-sharing agreements with European carriers. / [9] Decision No. 377/2013/EU, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32013D0377:EN:NOT / [10] www.icao.int/Meetings/a38/Documents/International%20Scheduled%20RTK%20(Annual%20Report).PDF / [11] www.icao.int/Meetings/a38/Documents/WP/wp424_en.pdf / [12] www.icao.int/Meetings/a38/Documents/WP/wp425_en.pdf / [13] At press time, it was unclear whether or how the European Parliament would respond to this development. / [14] www.icao.int/Meetings/a38/Documents/WP/wp068_rev2_en.pdf / [15] "Market-Based Measures: Achieving Carbon Neutral Growth from 2020," in ICAO 2013 Environment Report Destination Green (ICAO, 2013) at 150, http://cfapp.icao.int/Environmental-Report-2013/#1 / [16] Any impact on air ticket prices would be minimal. At $4-6/ton, Carbon Neutral Growth from 2020 could add an estimated $1.50 to $2 to a one way fare from Paris Charles de Gaulle to New York JFK in 2030. www.edf.org/sites/default/files/BNEF_EDF_Carbon_Neutral_Growth_For_Aviation_At_What_Price.pdf / [17] Calculated using combustion conversion. Consuming 1 tonne of aviation fuel results in 3.2 tonnes of CO_2. Additional information on offsetting potential from the aviation sector available: http://pdf.pwc.co.uk/fasten-seat-belts-a-sustainable-future-for-aviation.pdf / [18] Report of the Assessment of Market-Based Measures, ICAO Doc. 10018 (ICAO 2013), at www.icao.int/Meetings/a38/Documents/10018_en.pdf ; and Offsets for International Aviation Emissions (ICAO 2012), at www.icao.int/Meetings/a38/Documents/Offsets%20for%20International%20Aviation%20Emissions.v10.14%20August.pdf / [19] The aviation industry body adopted voluntary targets in 2009 to cap total emissions at 2020 levels (carbon neutral growth), improve efficiency by 1.5% each year to 2020 and then reduce emissions by 50%, by 2050 on 2005 levels. These targets are ambitious given expected traffic growth of more than 5% annually. See www.iata.org/pressroom/pr/Pages/2009-09-22-01.aspx; and see www.icao.int/Meetings/a38/Documents/WP/wp068_rev2_en.pdf

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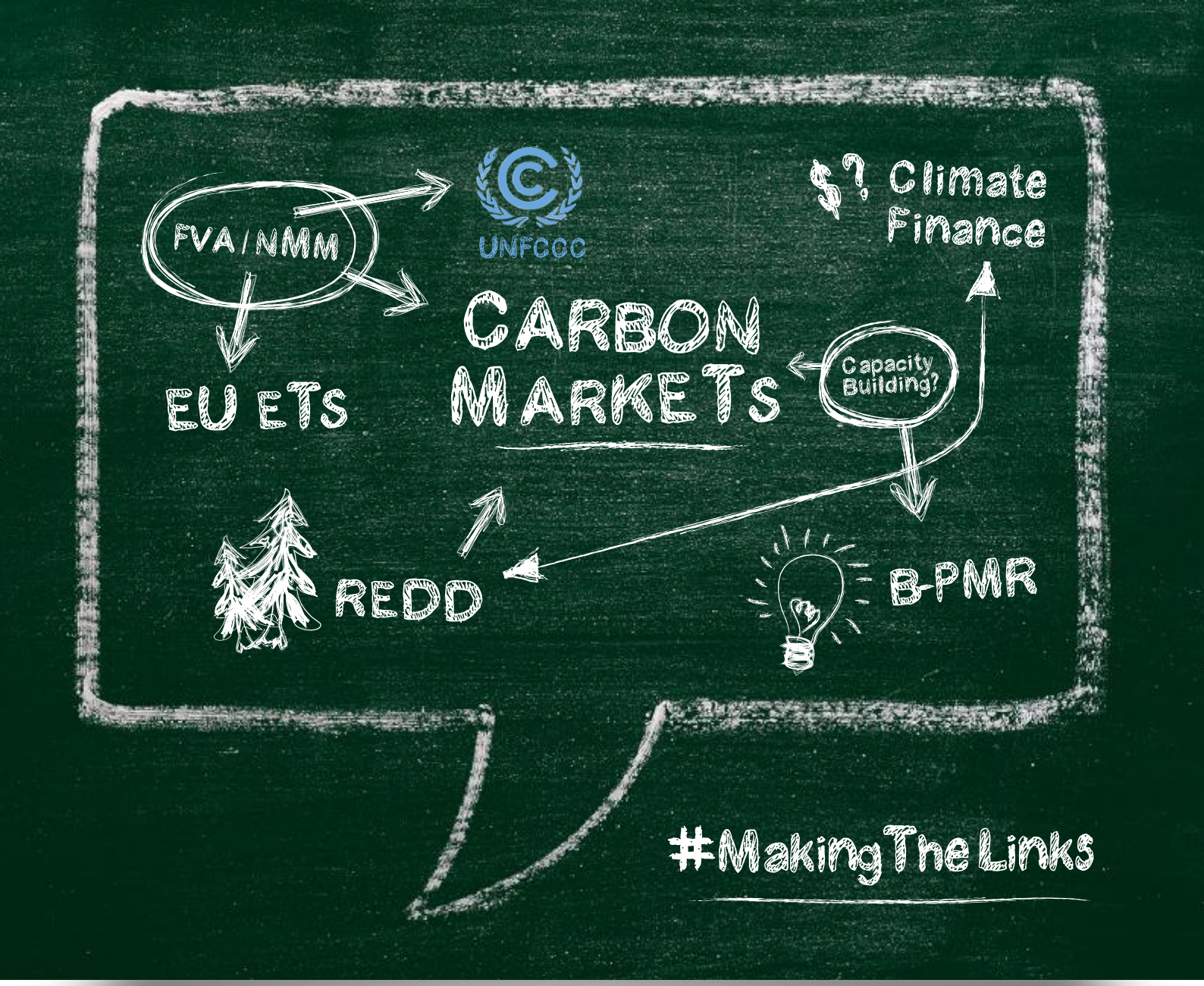
THE DESIGN

WHAT MAKES CLIMATE POLICY TICK



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Guy Turner, Bloomberg New Energy Finance (BNEF)

PROSPECTS FOR THE WORLD'S OFFSETTING MARKET – CAN THE PATIENT BE CURED?

Not to put too fine a point on it, the world of carbon markets has been defined by the offset – the ability to use emission reductions from outside the capped regime. From a theoretical point of view, it is the offset that distinguishes emissions trading from the other main economic instrument to address climate change, a tax. Without offsets the economics of emissions trading and a tax look virtually identical.

Offsets hold this central position in emissions trading designs for four key reasons. Firstly, because offsets offer access to a potentially unlimited pool of credits, they provide an effective means of limiting price rises in the capped market. In the EU Emissions Trading Scheme (ETS) the importing of offsets has been so effective in limiting price increases that they have added to the oversupply situation and in part contributed to the fall in prices. In new and emerging schemes, such as in California, South Korea, China and the potential scheme covering international aviation, where the risk of high prices is a major consideration, offsets provide one of the most important price containment mechanisms.

Secondly, offsets provide a direct financial incentive to a wide range of emission abatement options that are often difficult to capture under a cap and trade system. For example, the Clean Development Mechanism (CDM) includes methodologies for projects as diverse as changes in land use and animal farming practices, reductions in fugitive emissions of methane from pipelines and reductions in SF_6 emissions in the magnesium industry. Thirdly, offsets allow the inclusion of emission reduction options from sources that would not be covered by a cap and trade scheme for other reasons. In the context of the UNFCCC framework, for example, this includes developing countries that have been absolved of absolute caps on emissions but where there are opportunities for reducing the rate of growth of emissions.

Finally offsets help mobilise capital for the purpose of reducing emissions. Under a cap and trade scheme abatement projects are mostly financed on the balance sheets of companies covered by the cap. They therefore compete for capital against other projects that the firm could undertake. In a volatile emissions market making the case for long term investments that reduce emissions can be tricky when compared against other investments with more certain returns, such as direct energy saving projects, or those that could help grow the business such as new production capacity, research and development (R&D) or sales activities. In the extreme, where allowances are allocated for free and the firm is within its cap, often allowances are valued at zero cost and hence there is little financial incentive to reduce emissions. Under an offsetting scheme capital is invested directly in an emissions project and returns made on the sale of the credits. This ability to identify the carbon offset as a singular investment focus enabled CDM investment funds to raise some USD 15bn of capital between 1999 and 2008.[1]

The patient falls sick

In spite of these benefit, the world of offsets is in a sickly state. Prices of Certified Emissions Reductions (CERs) have collapsed to under EUR 0.5/t under the weight of excess supply. The following figures highlight the problem.

Based on the current projects in the CDM pipeline Bloomberg New Energy Finance (BNEF) calculates that the CDM has the potential to issue an additional 4.0 billion tons (bnt) of credits between 2013 and 2020 over and above the 1.8bnt of CERs and ERUs already issued by the end of 2012. In practice many of these credits will remain unissued because their value is less than the cost of verifying the emission reductions. Taking this into account we estimate that actual future supply would fall to around 1.4 - 2.0bnt at the current forward price for CERs.

Even this lower supply volume however is likely to easily meet global demand for offsets from known and proposed cap and trade schemes. Currently the only existing schemes where there is firm demand for CERs are in the EU in the form of the EU ETS and obligations of European governments under the EU's Climate and Energy Package to 2020. We estimate this demand to be around 830Mt over the period 2013 to 2020.

The CDM has the potential to issua an additional 4 billion tons of CERs between 2013 and 2020

Australia, New Zealand and Japan also have proposals to put in place emission reduction targets up to 2020, although none of these proposals have been ratified and in fact currently look less likely to go ahead. The newly elected Australian Prime Minister, Tony Abbot, is trying to dismantle the country's emissions trading scheme, while Japan's approach to offsets, which is structured around bilateral agreements between Japan and supply countries, appears to be more designed to support Japanese trade than the purchase of offsets. On the somewhat optimistic assumption that these proposals are implemented and Japan re-engages with the CDM, demand for CER from these countries could be in the region of 330mt from mid-2013 up to 2020.

The maximum demand for offsets from the EU, Japan and Australia from 2013 to 2020 therefore, would be around 1.2bnt. This compares with a lower supply estimate of 1.4-2.0bnt, but noting that supply could easily ramp up to over 2bnt with little increase in price. Under these conditions there seems little hope that the over supply situation can be resolved with little hope of a revival in prices.

The medical diagnosis of the CDM patient would therefore make grim reading: over-fed and over-weight with potential life threatening complications.

A new cure

The doctors however are not giving up. Their greatest hope is a new, and as yet untested, cure – developing country trading systems. The countries in the frame are South Korea, China, South Africa and the international aviation sector.

South Korea is currently planning to implement an ETS in 2015 and, on the basis of the latest texts, will allow participants to use offsets for up to 10% of their compliance obligations. The scheme would however restrict offsets to those generated in South Korea. Progress on implementing the scheme so far has been slow as the early designs contain complicated and sometimes conflicting priorities. Opposition to the scheme is also strong, particularly from local industry, in view of the potentially high prices that could prevail. If the scheme does go ahead as planned however and full use of made of the offset mechanism, new domestic projects would need to be created as there is insufficient capacity in the South Korean CER pipeline to meet demand.

China is in the process of creating seven pilot emissions trading schemes. Offsets are proposed as part of the schemes with demand ranging between 8% and 15% of total emissions in each region. As with South Korea offsets are restricted to those created in China. In total, we calculate that demand for offsets from the pilots could reach over 500Mt out to 2020. This assumption however is subject to many uncertainties. Only one of the pilots (in Shenzhen) has officially launched so far, and it is unlikely that all of the pilots will be fully up and running from next year. In addition, it is not yet clear how long the pilots will run for, as a national-level ETS is planned for 'post-2015'. For now, in terms of estimated offset demand, it is prudent to exclude China's national-level trading scheme from modelling, as no details are currently known about the size, scope or ambition of a future national programme.

South Africa is in the process of imposing a carbon tax on power generation and heavy industry. Importantly though covered entities will be able to use CERs - as well as non-US accredited offsets such as Verified Carbon Standard (VCS) and Gold Standard - for up to 5-10% of emissions under current proposals. This could create a demand of over 200Mt over the years 2015-20. The scheme will however only accept South African CERs from certain project types.

Compliance programmes covering international aviation and shipping would potentially create demand for UN offsets. A market-based mechanism covering international aviation has proceeded through the first gates of the ICAO decision-making process and if the initiative continues as planned, it would create a material demand for offsets post-2020. To the extent that forward purchasing occurs prior to 2020 this would create a demand for offsets prior to 2020.

Overall, if these schemes are implemented and scaled as planned we calculate that they would need a further 1bnt of offsets to satisfy demand by 2020. If these schemes came to pass it

would provide a welcome boost to global offset demand and help address the oversupply problem. That said, it won't solve it completely. The current CDM pipeline could absorb another billion tons worth of demand in addition to this new demand if prices were to rise.

As noted above, each of these new schemes currently only allow credits from domestic projects. This means that the supply-demand balance in an individual country could drive a need for investment in offsets in that country, irrespective of the state of the global balance. Indeed this is what would need to occur in South Korea and South Africa where the CDM pipeline in each country is insufficient to meet demand.

A final diagnosis

In summary, the CDM patient is certainly ill and the doctors are wearing permanent furrowed brows: the conventional market for offsets from developed countries is unequivocally over supplied up to 2020 and none of the obvious remedies being considered provide quick fix solutions. The medicine offered by the proposed schemes in China, South Korea and South Africa would help and breathe some life back into the bloated CDM pipeline. But as with all things medical we are playing probabilities. One just hopes that the patient fights on while the doctors come up with a more reliable cure.

Each of these new schemes currently only allow credits from domestic projects

(Endnotes)
[1] Source: Bloomberg New Energy Finance, 2009, Carbon Market Update Q3 2008. Note – approximately USD 11bn raised from private sources, USD 4bn from public sources.

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Guy is Chief Economist and Director of Commodity Research in Bloomberg New Energy Finance. In this capacity he is responsible for global analysis and business performance across power, gas and carbon markets as well as economic forecasting for all markets and geographies. Guy is also manages the company's global consulting business. Guy joined New Energy Finance in 2006 to set up New Carbon Finance – the business dedicated to forecasting the world's carbon markets and now absorbed into Bloomberg New Energy Finance – and he was part of the management that sold the company to Bloomberg in 2009. Guy has over 20 years experience as a consultant and business manager in the fields of energy economics and climate change. He has worked for several governments to help design policies and advise companies on strategic choices in the environmental and energy sector. Guy holds degrees in Economics and Engineering from the University of Birmingham (UK), an MSc in Environmental Policy from Manchester University and is a graduate of the London Business School Corporate Finance Programme. He is also founding participant and member of the Carbon Market Investors Association, a member of the Barclays Environmental Markets Index Committee and a guest lecturer at Cass Business School in London.

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FRAGMENTED MARKETS WITH FRAGMENTED MRV PRACTICES – DOES IT MATTER?

'The carbon market' is a misnomer. There is not one market for carbon but a melting pot of national, regional and sectoral schemes. As a consequence, we have an 'alphabet soup' of diverse credits, generated by numerous markets, which have value to different organisations in various countries. Whilst there is international agreement on the need to first quantify and then reduce carbon emissions to mitigate climate change, there is no agreement on the best approach. And rightly so, as clearly, 'one size cannot fit all'. Individual nations and sectors must be able to implement the most appropriate and cost-effective ways to reduce their emissions, while securing economic growth.

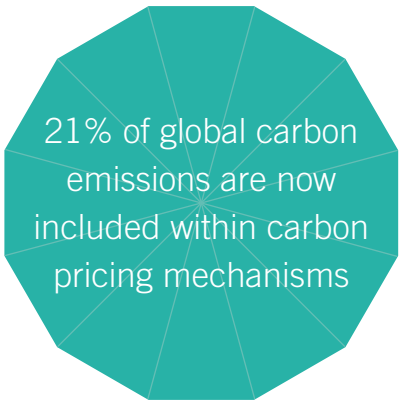
Thus these schemes do have distinctive and unique design features, but also common solutions to their challenges - not least relating to monitoring, reporting and verification (MRV). Scheme designs ultimately come down to political and strategic decisions, underpinned with technical priorities. Some commonality is necessary, and some degree of variance is inevitable, but much is not significant. This variance does however come with potential consequences, including cost burdens and barriers to trade, both of which represent potential risks to international competitiveness.

It is therefore the necessary commonalities and the consequences that should be the main focus of concern when designing new carbon market mechanisms, as these will potentially limit the possibility for future linkage across schemes and, in turn, the overall mitigation potential. Those differences that neither affect these consequences, nor detract from the quality of the data generated, can and should be accepted.

Through current collaborative approaches between parties, experiences are being shared and developments coordinated with sight on potential linkages down the line. Together with the UNFCCC's umbrella Framework for Various Approaches (FVA), there is hope for ensuring that these schemes, despite their differences, all deliver consistent and comparable mitigation outcomes that are real, permanent, additional and verified.

Since the fragmentation of the carbon market is well known, it is not necessary to detail the many market mechanisms, regulations and schemes in operation and currently under consideration. In total, 21% of global carbon emissions are now included within carbon pricing mechanisms and when emissions in China, Brazil, Chile and other emerging economies are covered, this could reach 50%.[1]

With mechanisms originating from different governments with differing priorities, it is clear to see how and why the carbon market has become so diverse and in turn why scheme design features, including those relating to MRV systems, can and have become so fragmented.



Whilst there is clearly a case for coordination of schemes to minimise variations and their consequences, it is necessary to recognise which elements require consistency and those which do not.

The primary decisions made by existing schemes - and those currently being considered by emerging economies designing new carbon market mechanisms - are political and strategic; they are not technical. The underlying decisions will be supported by science and technical principles, but at the outset, technical issues are not paramount.

The main aim of these initial political decisions within all schemes is to achieve cost effectiveness - achieving the desired mitigation target at the lowest possible cost. Achieving cost effectiveness requires a maximisation of trade opportunities across activity, geography and time. Therefore scheme design that maximises the sectoral, geographical and temporal boundaries is king.

Boundary considerations - and through these, the scheme's cost effectiveness

- will be further impacted by a number of factors including: the degree of environmental ambition; the overall aims for domestic emissions reduction versus global carbon trade; the acceptance or not of offsets; the sectors to be covered; allocation practices; carbon leakage avoidance and cost containment mechanisms. Clearly, decisions on these design elements will therefore have the greatest impact on the overall success of any scheme.

In this diverse market, it should be noted that the geographical boundaries and the benefits in relation to cost effectiveness of schemes can only be maximised by linking, enabling participants to take advantage of mitigation options on a global scale. Therefore, focusing on boundary considerations and cost effectiveness will help to minimise variations across schemes, minimise the resultant consequences, and help to facilitate linking.

Ultimately decisions of a more detailed technical nature, including those related to MRV, will need to be made. And again variations at this level are inevitable because sector unique features and existing standard practices come into play.

The essential considerations in relation to MRV are that the resultant data is consistent and comparable across schemes. Comparability is necessary for jurisdictions to consider linking and to avoid concerns over competitiveness and leakage. To achieve this, all schemes must ensure that the data is subject to independent MRV and that MRV principles are clearly defined to ensure transparency and completeness of the data whilst minimising uncertainty.

The differing methods to achieve that outcome are not significant. Different sectors will need to apply different monitoring approaches. Monitoring practices and the equipment required cannot be identical on land, in the air and at sea, for example. However, it can achieve comparable results. Similarly, standard practices that are regulatory accepted and therefore extensively applied and functioning well, must be factored into the MRV elements of carbon market mechanism design to ensure efficiency and reduce cost burdens for operators.

These specific areas of focus will bring consistency and comparability of scheme design, to help minimise variations across schemes and the resultant consequences, and enable opportunities for linking a global carbon market. And steps are already being taken to assist in achieving this.

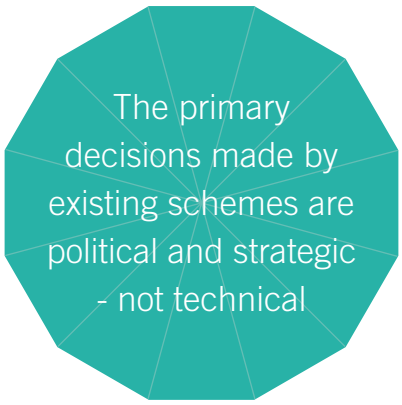
Regulators and stakeholders now have substantial knowledge and understanding gained from experience in designing and operating carbon markets and MRV systems. In addition, countries are coordinating with each other to learn from these experiences. For example, the EU is currently supporting China to develop new climate regulations, to initiate their national carbon trading scheme, and to procure a low carbon roadmap to 2015. Similarly, California and Australia have signed a memorandum of understanding (MOU) to share information and support building capacity to address climate change.

The governments of a number of countries are also advancing further than simply coordination to actively progressing the linking of their schemes: California and Quebec approved a link as of 1st January , 2014; the EU and Australia have announced intentions to fully link by 1st July, 2018; the Kazakh emissions trading scheme (ETS) is considering links with the EU and other countries; and Korea is designing key elements of its ETS in line with those of Europe in order to minimise any need to change for potential future linking opportunities.

In support of actions by individual countries are initiatives such as the World Bank's Partnership for Market Readiness (PMR). This is a global partnership of developed and developing countries that provides funding and technical assistance to support and facilitate the development of carbon market-based instruments in developing countries.

Finally, in recognition of the diversity of schemes within the carbon market, the need for a framework under which all can operate has been identified at UNFCCC level. The FVA is a general framework, which is currently under development and aims to provide an umbrella for emissions reductions approaches at national and regional levels or multilaterally, enabling individual mechanisms to be designed for local needs whilst meeting consistent standards. Discussions for how the FVA will work continue, but it is anticipated to provide a set of common principles against which all mechanisms must comply to ensure real, permanent, additional and verified mitigation, whilst avoiding double counting and ensuring a net decrease and/or avoidance of carbon emissions.

To effectively address the global problem



of climate change and minimise global average temperature rise to 2°C requires action from all sides. The momentum of mitigatory action should not be slowed by unwarranted concerns over the need for identical approaches.

Providing that the mechanisms and systems are sufficiently transparent to provide confidence in the accuracy and completeness of the data, and thus comparability across schemes, then the markets can be sufficiently assured that: real and permanent emission reductions are being achieved; that linkage can be pursued; that mitigation is maximised, and success achieved.

On the path to climate change mitigation strategies, this can only be a positive step.

(Endnotes)
[1] Mapping Carbon Pricing Initiatives – Development and Prospects. The World Bank, 2013

About the Author(s):

Madlen King is global head of climate change and sustainability for LRQA. LRQA is the world's leading independent provider of assessment services including certification, validation, verification and training across a broad spectrum of standards and schemes. LRQA is recognised by over 50 accreditation bodies and delivers services to clients in more than 120 countries. In the climate change and sustainability arena, LRQA's international services include the EU ETS, CDM, JI, ISO 14064, PAS 2050, corporate responsibility report verification, ISO 50001 and ISO 14001 as well as a range of regional and national standards and schemes. Madlen is involved in shaping the future of environmental policy through engagements with national governments, the European Commission, the European Co-operation for Accreditation, IETA and as vice president of the DIA. In addition, Madlen is a member of the Institute of Environmental Management & Assessment, is a Principal Environmental Auditor and is a Chartered Environmentalist. Madlen holds a Bachelor's (BSc) in Environmental Science and a Masters (MSc) in Environmental Management.

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DNV Climate Change Services AS

WHAT'S COVERED? TRENDS IN COVERAGE OF DIFFERENT SECTORS AND GASES IN CARBON MARKETS

In recent years we have seen a steady growth of local emission trading programmes. In addition to the EU ETS, which has been operational since 2005, there are now around 15 different programmes operational in various jurisdictions. Some of these programmes have started or have linked with each other but predominantly they operate independently, with a clear domestic or regional objective. This paper will look at these developments and try to examine whether different schemes really that different from each others.

The main focus is on the coverage of different gases and sectors - the parameters that define what governments want to impact through emissions trading. We have seen a number of approaches undertaken in different jurisdictions. This article looks at the following:

- Is there a trend towards convergence or divergence in coverage of sectors and gases?
- Are these trends blocking any future linking?
- What is the role of bilateral and multilateral agreements?

Has there been a convergence or divergence in the coverage of gases and sectors as different schemes?

Examining the different systems (see Figure 1), it could be argued that the market has seen a large diversion in methods and coverage of gases and sectors. However, others would argue that there has been a convergence. Answering the question in itself is neither easy nor straightforward. Of course one can argue that because the EU ETS only looks at CO_2 emissions and other countries look at all the 6 GHG gases covered under the Kyoto Protocol within their ETS, the result is that there is a diversion away from the EU approach. Equally one can see that the applicable sectors under each scheme are not uniform, even though overlaps do exist.

FIGURE 1: COVERAGE OF GASES AND SECTORS IN ETS' ACROSS THE WORLD. SOURCE (IETA AND EDF)

Jurisdiction	Status	Emissions egulations		
		Economic sectors covered	Thresholds	Gases covered and Point of obligation
EU	Started 2005 Phases: I: 2005-07 II: 2008-12 III: 2013-20 IV: 2021-onward	Covered installations are grouped in the following sectors: power combustion (by far the largest emitting sector), oil refining, coke and steel, cement and lime, glass, bricks and ceramics, pulp and paper, and miscellaneous. Approximately 40% (43% in Phase III) of total emissions covered, totaling 11,500 installations, 5,000 companies, and 30 countries.	Installations that emit below sector-specific thresholds can opt out of the program.	Phases I and II: CO_2 Phase III: CO_2 and industrial gases, such as PFCs from aluminum and N2O from Nitric Acid Point of obligation: point of emissions, downstream
Australia	Carbon Pricing Mechanism (CPM) began in July 2012. Trading is scheduled to begin in July 2015.	Stationary energy, industrial processes, fugitive emissions, non-legacy waste, commercial transport. Excluded: some parts of the transport sector. Agriculture is not capped, but it is a source of offsets through Carbon Farming Initiative. ETS coverage of capped sectors is about 60% of Australia's GHG emissions. Including other sectors that have an equivalent price, this percentage increases to about 67%.	Generally, any facility generating over 25ktCO_2e/yr. Exception: landfill emissions are covered for sources above 10,000 tCO_2e/yr.	CO_2, CH4, N2O, and PFCs from aluminum smelting. Other synthetic GHGs are excluded from CPM but will have an equivalent carbon price imposed using already existing national regulations. Point of Obligation: downstream for most sectors. Beginning in 2013, upstream for LPG and LNG with provisions.

Jurisdiction	Status	Emissions egulations		
		Economic sectors covered	Thresholds	Gases covered and Point of obligation
California	Started 2013 Phases: I: 2013-14 II: 2015-17 III: 2018-20	Phasing in sectors from 2013 (generation emissions from first deliverers of electricity; and process emissions for a range of large industrial sources, including refiners of petroleum and natural gas) to 2015 (suppliers of natural gas, distillate fuel oil, and liquefied petroleum gas). Covers 85% of CA emissions by 2015	Covers facilities generating over 25ktCO_2e/yr.	Gases: CO_2, CH4, N2O, HFCs, PFCs, SF6, NO3. Point of obligation: sector- specific
New Zealand	Started 2008 Covered sectors will gradually phase in from 2008 to 2015.	Forestry entered in 2008; Stationary energy, liquid fossil fuels and industrial process [various triggers] (from 2010); waste (all landfill operators), synthetic GHGs (from 2013); agriculture inclusion originally scheduled for 2015, but this has been delayed indefinitely pending a 2015 review.	Sector-specific	Covers six gases (CO_2, CH4, N2O, HFCs, PFCs, and SF6). In addition, HFCs and PFCs from imported motor vehicles and other goods are covered by a levy instead of the ETS. Point of obligation is sector- specific and generally upstream. Uniquely, in the NZ ETS, the point of allocation differs from the point of obligation.
Quebec	Started 2013 Phases: I: 2013-14 II: 2015-17 III: 2018-20	Phasing in sectors from 2013 (major industries and electricity generation) to 2015 (fuel providers). After 2015, approximately 85% of Quebec's emissions will be covered.	Covers facilities generating over 25ktCO_2e/yr, totaling approximately 80 facilities in the first compliance period	Covers CO_2, CH4, N2O, HFCs, PFCs, SF6, and NF3. Point of obligation: generally downstream, except upstream for fuel distribution.
China	Two provinces (Hubei and Guangdong) as well as five cities (Beijing, Tianjin, Shanghai, Chongqing, and Shenzhen) are currently considering emissions trading legislation as part of a national carbon trading pilot program. National ETS targeted to begin 2016-2020.	Pilot schemes differ. Regarding a potential national ETS, NDRC states, "the covered sectors should reach certain emissions volume and have significant potentials for emissions reductions; otherwise, it is hard to achieve the objective to cut greenhouse gas emissions through [a] market mechanism."	TBD	TBD
RGGI	Started 2009 Phases/compliance periods are every 3 years: I: 2009-11 II: 2012-14 III: 2015-17…	Covers fossil fuel-fired power plants.	Plant producing >25MW (168 total) in CT, DE, MA, MD, ME, NH, NY, RI, VT (and formerly an additional 40 in NJ)	CO_2 only Point of Obligation: Downstream (at installation level)
Korea	Starting 2015 Phases: I: 2015-17 II: 2018-20 III: 2021-26	Capped emitters are determined by thresholds; companies that annually discharge over 125,000 tCO_2e and/or workplaces that annually emit over 25,000 tCO_2e are required to submit allowances for each ton of CO_2e that they produce. 490 emitters, totaling 60% of national emissions, are covered.	Covers firms >125KTCO_2e over a three year average and installations >25KTCO_2e (450 emitters and 60% of national emissions).	Gases: CO_2, CH4, N2O, HFC, PFC, and SF6 Point of Obligation: Downstream

Jurisdiction	Status	Emissions egulations		
		Economic sectors covered	Thresholds	Gases covered and Point of obligation
Kazakhstan	Started 2013 Phases: I: 2013 (pilot) II: Either 2014-20, or these years will be split Phase II (2014-2015) and Phase III (2016-2020)	Oil and gas production; The power sector; Mining and metallurgy; Chemical industry; Agriculture (inclusion currently being debated); and Transport (inclusion currently being debated). 178 companies, which emit 147 $MtCO_2e$ (55% of Kazakhstan's GHG output and 77% of CO_2 emissions), are covered.	Major emitters (companies that emit >20$KtCO_2e$/yr). Subjects of Administrative Regulation (SARs, <20KtCo2e).	Gases: Only CO_2 in Phase I; Other gases may be added in future periods. Point of Obligation: Downstream, company-level. After Phase I, companies are obligated to report third- party verified data at the installation level.
Alberta	Started 2007 (emissions intensity targets rather than absolute)	All industrial facilities, including: chemical and fertilizer manufacturers; coal mines; forest product producers; gas plants; mineral processors; oil sand miners, upgraders, and extractors; petroleum refiners; pipeline transportation; power plants; and waste management.	Covered firms must have emitted > 100,000 tCO_2e in 2003 or a subsequent year.	CO_2, CH4, N2O, HFCs, PFCs, and SF6
Norway	Active since 2005. Linked bilaterally with EU ETS in 2009. Full integration with EU ETS in 2013 (start of Phase III)	Energy production; refining of mineral oil; coke production; production & processing of iron & steel; productions of cement, lime, glass, glass fibre, and ceramic products; and production of paper, board, and pulp from timber or other fibrous materials. Combustion from biomass, hazardous waste, or municipal waste is excluded. Close to 80% of covered emissions derive from fossil fuel combustions, to which petroleum was added in 2008 and is now responsible for 60% of all covered emissions.	Thresholds: Same as EU ETS In Phase II, the Norwegian ETS covered more than 100 entities and about 40% of the country's projected emissions.	Phase I (2005-2007): only CO_2 Phase II (2008-2012): CO_2 and N2O Phase III (2013-2020): maybe non-CO_2 emissions from aluminum and ferroalloys
Switzerland	Started Jan 1, 2008 as complement to national CO_2 tax.	Sectors with companies covered by the ETS include: ceramics, paper, plastics, aluminum, glass, chemistry, metal-working and engineering, foodstuffs and lime, foundries, printers, and haymakers As of July 2011, about 950 companies had se caps and about 430 of these companies participated in the Swiss ETS. For 2010, the total cap was 3.42 $MtCO_2$, covering about 7% of Swiss emissions.	Must emit >0.25 $MtCO_2e$/year to qualify as direct participant	Gases: CO_2 only Point of Obligation: Downstream

These differences between ETSs can be explained and should be expected when looking at the jurisdiction in which the ETS operates, from their GHG footprint, industries and political background. In other words, the differences in the ETS not only reflect the local circumstances in the countries but also a reflection of the political ambition and priorities. Do differences between the schemes also mean that one can not link or compare the effectiveness of their environmental and economic impacts? For example, in New Zealand, the forestry sector is covered under their ETS because it is a large source of their national emissions. Conversely, in Europe forestry emissions are controlled using other policies, and the focus of emissions trading is on large industrial emissions sources. However, the truth is that the carbon market can still link jurisdictions with unequal scope and coverage.

- When examining each ETS, there are two important points to consider for sectors and gas coverage:
- The impact that the ETS programme has on the industries included, such as the political ambition or objective, and
- The technical aspect of managing the scheme, i.e the oversight and MRV.

The first component requires consideration of the impacts of uneven coverage. This need not occur in the context of linking – a local industry may question why they are covered under an ETS, against the trend of other market approaches in other jurisdictions. Governments must take this into consideration when designing schemes, but coverage should also reflect local capacity and circumstances.

The technical consideration of the programme must follow and support the political decisions made over how wide to stretch ETS coverage. Critically, accurate data of emissions, current and historical, is an essential pre-requisite of enabling an industry or GHG to be included in an ETS's scope. In the absence of this data, establishing allocations, benchmarks or industry targets will be less accurate and could lead to either misallocation of allowances or an incorrect cap.

Without properly implementing the technical aspects of the programme, linking efforts will be difficult if not impossible. Among others the following examples illustrate how the technical aspects of programmes may facilitate or block linking:

- With the increasing introduction of auctioning within the different programmes, the implementation costs of ETS programmes become more apparent, as well as the possible impact on competativeness through additional cost burdens. Therefore, accurate emissions data collection is an essential pre-requisite to including a sector under a market mechanism.
- With the desire to protect industry from high implementation costs. Meanwhile providing price caps may be seen as a adequate solution. However, after linking with an ETS without similar price caps, could lead to government subsidies;
- With increasing efforts put on the accuracy around MRV, weak or unclear enforcement around the findings of the MRV systems may lead to distrortion among competitors within the system if it is perceived that different installations will be differently affected following identical non-compliances.

As we can see from the examples above, when examining across systems, one does not necessarily look directly to the gases covered and the industries affected, but more to the impact that coverage gaps will have on respective industries and the market in which the industries operates. Having established this, one starts to look at the robustness of the system itself, i.e. how stringent are the different systems and do the penalties have a proportional impact. For example, within China's seven ETS pilots, enforcement lies ultimately with the National Development and Reform Commission (NDRC), and industry is raising questions on how enforcement and equal treatment can be ensured.

We are seeing a divergence in coverage, from a sectoral and pollutant point of view. It is clear that not all the schemes currently cover the 6 GHG gases under the UN climate change convention - some only cover the CO_2 emissions whereas others do cover all 6 gases. However, all schemes operate with units that are based on a ton of CO_2eq or a variation thereof. As explained earlier the units within the system may not be the driving force in determining whether systems are comparable and/or can be linked but more the systems deployed to control and monitor the performance and the political ambition that the scheme represents.

What are the technical considerations and challenges faced in including certain sectors?

Impacting the emission pathway of any industry is challenging, not so much in terms of the technical aspects of the reduction but more in terms of identifying effectively what will alter the emission pathway at the production line. In other words, identifying the lowest abatements costs at which the emission reductions can be achieved. Designing an Emission Trading Scheme (ETS) will have to make assumptions on the possible different measures which can be taken and how high the abatement costs will be. Although many of the emission trading schemes have as their goal a

shift from emission intensive technologies towards promoting the use of lower carbon technology, most if not all emission trading schemes in operation have not seen a change in technology use but instead an optimisation of the industry production processes. Achieving operational efficiencies within the process take the brunt of the emission reductions achieved to date.

The question therefore is not which technology do we want to stimulate, but which changes in the current practices can lead to efficiencies among key emission drivers existing within that sector. At the same time, poor understanding of the key drivers behind the emissions of an industry could lead to unnecessary monitoring and reporting requirements. To illustrate this, achieving 95% accuracy within your emission reporting does not necessary mean that every meter needs to be able to measure at a 95% accuracy level. Neither does every meter need to be calibrated by an accredited institution if alternative forms of cross checking of measurements exist. Understanding the process within a sector and how these processes impact the emissions is the key challenge for each sector.

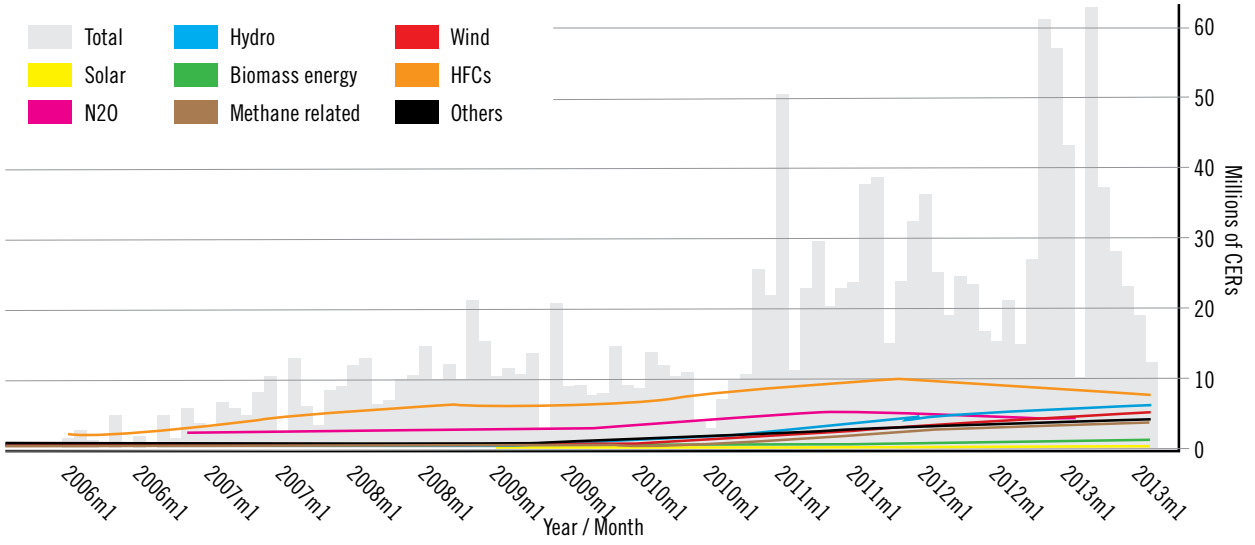
Transport is traditionally seen as one of the sectors that are difficult to include in emission trading systems or to effectively monitor the emission profile. The high number of variables that impact the total emissions of a transport system as well as the rational and irrational actions of operators within the system makes it difficult to identify those parameters with the lowest abatement costs that really impact the overall emissions of assessed the transport system. Nevertheless, by focusing in on efficiencies, major drivers behind the emissions responsible for the emission profile of the transport system will allow the transport sector to be included in an overall emissions trading scheme.

What is the impact of the US-China bilateral agreement on the facing out of HFC?

Ever since COP 9 in Buenos Aires, there has been considerable debate about the role of industrial gases in the carbon market - and particularly hydrofleurocarbons (HFCs). Not only have they been criticised by the market for not providing sustainable development benefits, but also the political debate around whether these gases would need to be regulated under the Kyoto Protocol or the Montreal Protocol. This has resulted in a considerable stalemate position in negotiations sessions of both Protocols. However, in terms of the market it became very quickly a non-issue. On the principle that under the CDM, only existing HFC installations would apply has meant that beyond those HFC projects that have been registered not many eligible installations existed. At the same time, potential buyers such as the EU have made these credits ineligible for compliance. As such, the market has already since 2009 moved on and the existing 19 projects currently within the system will gradually leave the CDM as their crediting periods expire.

Nonetheless, the agreement between the United States and China in June 2013, and followed up during the G-20

FIGURE 2: SECTORAL DISTRIBUTION OF CER ISSUANCE



Note: Trends are locally weighted regressions at a bandwidth of 0.50

Data as of 31 Aug. 2013
Source: UNFCCC & UNEP Risoe

Industrial gases remain a significant component of reducing overall emissions

summit in September, will most likely help to unblock some positions under the HFC contact group within Kyoto Protocol negotiations - even though the US is not part of this contact group. Although the link between the two protocols will continue, the commitments of both countries to clearly look at the phasing out of the HFC under the Montreal Protocol will hopefully allow negotiators within the KP contact group to build a further bridge between the two Protocols. For example, the outcome of the open-ended working group under the Montreal Protocol would form the basis of the framework under which the gases will be accounted for under the Kyoto Protocol. More importantly, however, is that the move by China and the United States to join efforts in addressing industrial gases could start a trend in which bilateral agreements between countries move ahead over international negotiations. This allows effective and direct measures so be taken by those that are part of such bilateral agreement.

What impact will there be to the carbon market as industrial gases received increasingly a different treatment under climate change policies?

Industrial gases have always been seen as the starters of the market. Through their low abatement costs they were able to quickly generate large amounts of Certified Emissions Reductions (CERs), which provided much-needed liquidity in the market. At the same time, however, they were seen as a source of easy profits with little to no impact on sustainable development. Indeed, the market has seen that industrial gas CERs have formed a substantial part of the issued CERs to date. The overall number of projects registered under the CDM however has remained low and concentrated to only a few countries. This has partly because of the restrictions on existing installations but also because production in general is limited to a number of countries only. Consequently, over time we have seen that, after the initial critical volume of CERs emerged on the market from these types of projects, the market has started to move to the more expensive abatement solutions (Figure 2), thereby losing their importance within carbon markets.

Nonetheless, industrial gases - with their high GHG potential - remain a significant component of reducing overall emissions as part of the global climate change policies. The bilateral agreement such as between the US and China, but also the move by the EU ETS to ban industrial gases from the compliance market has moved the focus to other policy tools. These need to be tools that, on the one hand allow those countries that are most affected to be part of the solution, whilst on the other hand isolating the sensitivities around competitive advantages from the overall climate change negotiations.

About the Author(s):

Edwin Aalders has 20 years of experience as an assessor in Environmental Auditing, Policy and Management of which 15 years in Climate Change. Mr Aalders is widely respected for his experience in relation to Climate Change strategies, MRV and the Climate Change negotiations, which saw him being involved in the development of programmes such as the ERUPT, EU ETS, CDM/JI, Verified Carbon Standard and more resent NAMAs and flexible mechanisms. Mr Aalders authored numerous publications and position papers in relation to the different market based instruments among his more resent publications saw him as the lead author of the Primer on MRV for NAMAs and PoA MRV as well MRV Manual for CDM PoAs. In addition Mr Aalders has contributed to numerous projects in relation to CDM,JI,VCS, various ETS', REDD+, City Low Carbon Strategies and NAMA rating.

Mr Aalders has been an elected member of roster of experts for the Methodology & Accreditation Panel Expert of the CDM & JI & ANSI, member of the JI Accreditation Panel, and is currently member of the VCSA AFOLU Steering Committee and Methodology Approval Committee and sits on the Pacific Carbon Trust Advisory Panel."

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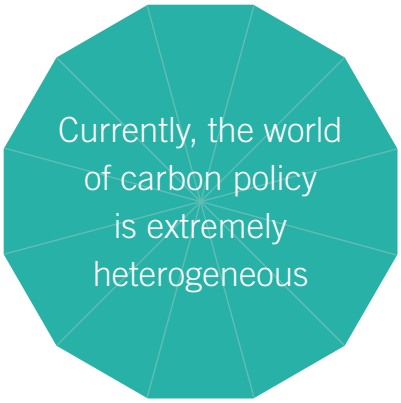
THE COST OF CARBON PRICING: COMPETITIVENESS IMPLICATIONS FOR THE MINING AND METALS INDUSTRY

In May, 2011 the International Council on Mining and Metals (ICMM) established a climate change program with the goal of ensuring the continued competitiveness of the industry in a low carbon future. While the strong preference of the industry is an eventual global regime with a common carbon price, ICMM's members are open to operating in national regulatory environments that are fair and transparent. To that end, ICMM commissioned a report with the International Institute for Sustainable Development (IISD) that begins to assess how best to develop carbon pricing policies that achieve a transition to a low carbon economy without compromising the ability of national industries to compete internationally. This article represents a summary of that report.[1]



The geographic regions analyzed include the European Union (EU), South Africa, and Australia, as well as sub-national jurisdictions within the US and Canada, namely California, Quebec, and British Columbia. These are regions where ICMM member companies have a significant production presence, and where there are climate policies currently in place or under development.

Four commodities are included in the analysis: iron ore, copper, aluminium and coal. These commodities encompass a range of widely produced and used outputs and a variety of extraction and production techniques in a number of locations globally. The analysis on iron ore and coal focuses on upstream; the analysis of aluminium focuses on the smelting process; and the analysis of copper covers both mining and refining processes to show the impact of carbon pricing on financial metrics for both upstream and downstream processes. Many of the lessons drawn from the analysis are applicable to the mining and metals industry as a whole.

Recent years have seen an increase in the number of proposed or implemented carbon pricing systems. Currently, the world of carbon policy and pricing is extremely heterogeneous with different rules for coverage and pricing in each scheme. To try and address that reality, governments typically introduce measures for energy intensive trade exposed (EITE) industries to try and offset those higher costs. The most frequently adopted approach seen in the systems under review is free allocation of allowances to industries that are most vulnerable. Other potential approaches include border adjustments (which have not been implemented to date), tax rebates, and direct financial aid to industries. While these measures provide some compensation, they may not be adequate to overcome the competitive impact of pricing in certain sectors. Furthermore, the level and scope of compensation provided for the four commodities is highly variable. The challenge is to identify a price signal that sufficiently protects industry while also serving as an incentive to reduce emissions in their operations. Indeed, in some cases there may be no room for a price signal due to other particular domestic circumstances, such as electricity costs, or acute international competitiveness pressures.

In our analysis, we focused on evaluating the impact of carbon pricing policies on key financial metrics for the mining and metals industry:

- Sales
- Capital spent (a measure of profit whereby earnings before interest, taxes,
- depreciation and amortization (EBITDA) are used)
- Cash costs (defined as a company's sales (revenue)) minus EBITDA.

Only publicly available information has been used and inferences are only made when directly supported by the evidence.[2]

Illustrative results for each of the four commodities considered are shown in

Figure 1: **Carbon cost impacts on aluminium production**

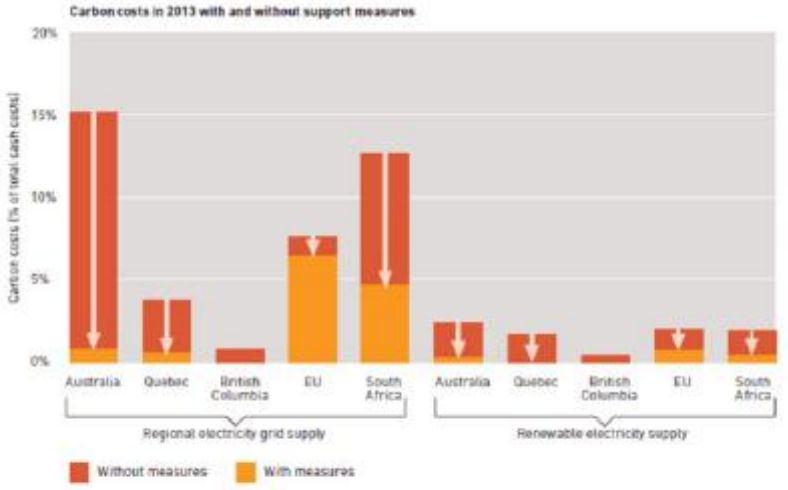
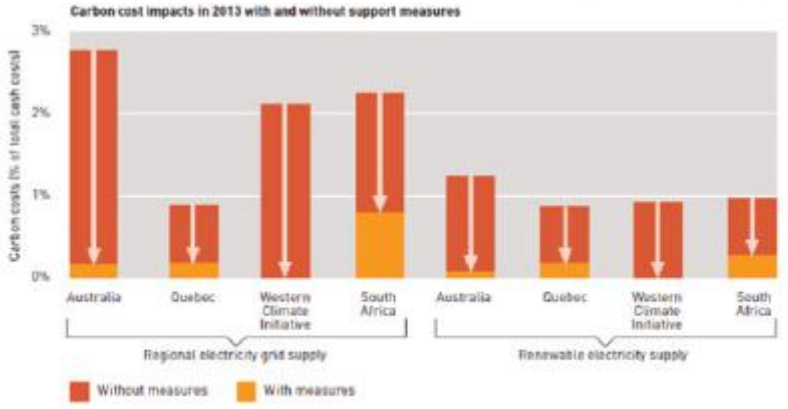


Figure 2: **Carbon cost impacts on copper production**
Note that at present, copper smelting is not undertaken in British Columbia; the results shown are therefore illustrative only



Figures 1–4, which compare carbon costs – based on levels set out in legislation or recent carbon market analyses – to the selected financial indicators. General inferences from the quantitative analysis are:

- As prices or tax levels increase, the scale of potential impact increases and the impacts become increasingly divergent between regions, largely due to differences in the electricity-generating mix.
- The inclusion or exclusion of a sector from compensation measures will strongly influence the cost impact of pricing on the bottom line.
- There is the potential for large variations on the impact of financial metrics from year to year, particularly for globally traded commodities.

Aluminium and copper production (see Figures 1 and 2) are both electricity-intensive industries. The impact of emissions reductions policies is likely to be acute if power generation is included and/or the electricity generation type emits high levels of greenhouse gases (GHGs). Analysis suggests if all costs are passed through to aluminium producers, carbon costs can be as high as 70 per cent of EBITDA. For aluminium, potential impacts are considerably lower if renewable electricity is purchased rather than electricity with a grid-based average carbon intensity. Compensation measures significantly reduce costs, except in British Columbia and in the EU, when grid-based electricity is consumed. A similar pattern of results is seen for copper, except that the difference in potential impacts between grid electricity and renewables is much less pronounced.

The impact of emissions reductions policies on iron ore mining is likely to be lower due to its relatively low emissions intensity. Figure 3 shows that the potential impact of carbon costs, without any compensation, is less than 1 per cent for all jurisdictions and all financial indicators. However, emissions intensity can vary across production sites and the policy impact can differ accordingly. The ranges on Figure 3 illustrate the variation that ICMM member companies have around these averages.

Figure 4 shows that the potential carbon costs for coal production are similar on average for the four jurisdictions where ICMM member companies have a significant share of production. However, coal production has a highly variable emissions intensity by mine, which depends on the product mined (metallurgical or thermal coal) and the type of mine (gassy or non-gassy mine).

Specific concerns for the mining and metals industry

PRICE

An indication of the percentage increase in costs of a carbon policy enables the easy identification of the most vulnerable commodities. The increase will be relatively low if the commodity's energy intensity of production is low, and if other costs, for example labour or capital, are high.

TRADE EXPOSURE AND EMISSIONS INTENSITY

Trade exposure should be considered at the installation level, keeping in mind

Figure 3: **Carbon cost impacts on iron ore production**
Emissions intensity data (indicated by vertical bars) submitted by ICMM member companies under the Carbon Disclosure Project

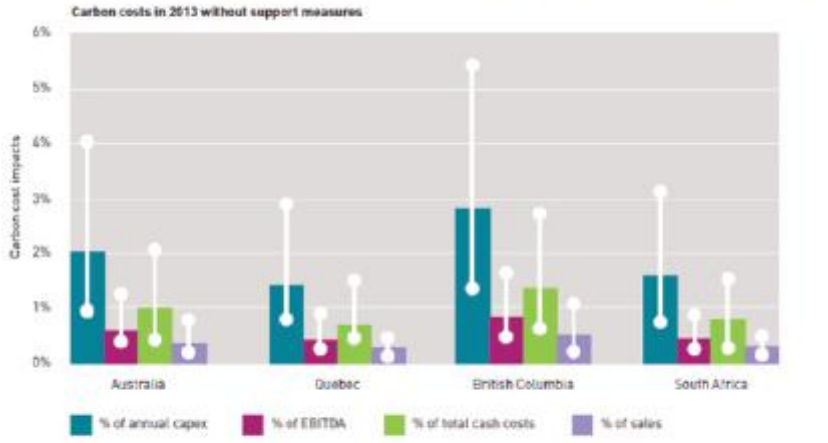
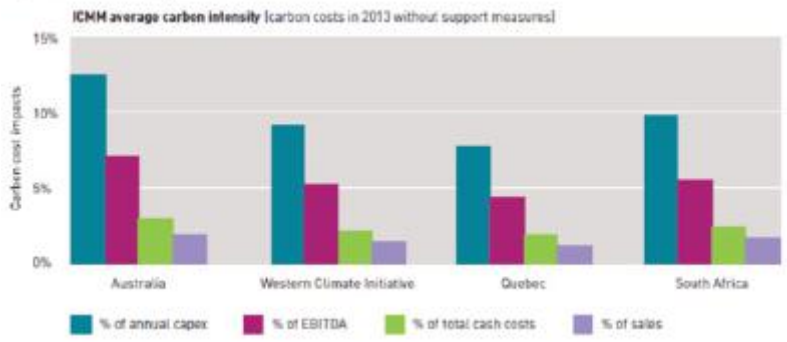


Figure 4: **Carbon cost impacts on coal production**



The Fuel mix of a grid is largely out of industry's control

that emissions intensity, while important, is not the only relevant consideration. Other considerations should include the scope of emissions coverage (direct and/or indirect), the sources of emissions (combustion, process, fugitive) and the types of gases that are captured by the system.

VOLATILITY OVER THE ECONOMIC CYCLE

The financial performance of commodity industries is highly variable and carbon costs become more or less affordable according to industry and market trends. Carbon systems need to be responsive to market turbulence.

EMISSIONS REDUCTIONS TECHNOLOGIES

The impact of carbon pricing can be more easily mitigated if there are low carbon technologies still to be implemented. Unfortunately, this is not often the case for energy-intensive industries: as energy is a major part of their production costs, its use has been largely optimised over a long period.

Recommendations

Based on the analysis undertaken, the following recommendations have been drawn:

1. ELECTRICITY, ELECTRICITY, ELECTRICITY! CAREFULLY CONSIDER THE TREATMENT OF THE ELECTRICITY SECTOR AND HOW THIS WILL AFFECT ALL INDUSTRIAL USERS.

Inclusion of the electricity sector within a system may result in carbon costs being passed through to users through their electricity bills. The potential impact is greater for those industries such as metal smelting that are electricity intensive and in cases where the electricity grid is fossil fuel dominated. The fuel mix of a grid is largely out of industry's control. To mitigate the impact, carbon pricing systems need to consider how best to treat the electricity sector and how to account for and mitigate any related increases in user costs.

2. LINK LONG-TERM EMISSIONS REDUCTIONS TARGETS INTO POLICY MEASURES

Significant reductions in GHG emissions from the mature processes used in the majority of mining and metals activities will tend to require significant investment in research, development, dissemination and deployment. Where carbon pricing policy is implemented, the objective of compensation measures should be to give support to industries in making the transition to a low emissions economy and to act against the disadvantages that are created by unequal carbon costs.

3. MAKE POLICIES SPECIFIC TO REGIONAL CONTEXT AND PRIORITIES

The introduction of climate change policy has to take into account the context in which it is being developed and implemented. Domestically, the level of economic and social development, the political and industrial support for the

policy as well as government priorities will help to determine the feasibility and likely impacts of policy. External factors, such as trade links and related policies in other jurisdictions, are also important.

4. PROVIDE CLEAR AND CONSISTENT INCENTIVES

The mining and metals industries have extremely long investment cycles with investments that may be developed and implemented over periods in excess of 50 years. As a result, policy certainty and stability is essential. However, establishing long-term targets for emissions reductions and long-term objectives for policies can bring some certainty to participants. More importantly, building a political and social consensus around the need for emissions reductions policies will increase the likelihood that such policies will continue to exist in the future.

5. REFLECT INDUSTRY AND FACILITY HETEROGENEITY IN POLICY DESIGN

Coverage of a carbon pricing policy should be broad enough to ensure that the cost of emissions reductions is shared across the economy and narrow enough to guarantee that the system is workable. The criteria for receiving support needs to be clearly defined and assessed on an industry-by-industry basis, with the understanding that they are one in a range of factors that affect the competitiveness of an industry.

6. ADOPT A COLLABORATIVE APPROACH AND AIM FOR A GLOBAL EMISSIONS SYSTEM

Policymakers should strive to build a political and social consensus on climate change policy. All industries that are likely to be affected by the introduction of policies should be consulted. Policymakers should also look to industry and government experience internationally to help design an effective carbon system. This could also facilitate the harmonization of various elements of policies such as reporting requirements and the use of offsets, reducing costs and competitiveness implications to participants. Such harmonization would also support a global emissions system in the long run.

(Endnotes)

[1] Authors and contributors to this document include Peter Wooders, Lucy Kitson, Greg Cook, Simone Cooper and John Drexhage. / [2] A full description of the inputs and assumptions to the quantitative analysis can be found in the full report.

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International Council on Mining & Metals

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John Drexhage most recently worked for ICMM where he worked as Director of Climate Change and Energy Management. Prior to that he was Director of Climate Change for the International Institute for Sustainable Development and Associate Director with the Government of Canada where he co-ordinated the government's international negotiations. His specific areas of expertise include the Kyoto based market mechanisms, development of national policies and competitiveness. is former Director, Environment and Climate Change at ICMM.

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CALIFORNIA'S RESPONSE TO THE LESSONS LEARNED FROM THE EU ETS: A CASE STUDY

Law-makers across the globe, including those in California, have observed the highs and lows of the last decade of design and implementation of the EU Emissions Trading Scheme ("EU ETS") , the world's first and largest greenhouse gas ("GHG") emissions trading scheme, and sought to incorporate lessons learned into their own cap-and-trade programs. California's pioneering cap-and-trade program came into force in 2013, challenging the received wisdom that the US is a perennial climate change laggard. The following is a selection of design features and lessons learned which California has developed, having noted the EU experience.

What happened in Europe

Opponents to cap-and-trade schemes often argue that such schemes are expensive relative to the abatement achieved and will have a negative impact on economic competitiveness. However, data from Phases I and II of the EU ETS evidences low-cost GHG emissions abatement achieved through a market-based mechanism, despite well-publicised issues. Such figures show that effective GHG emissions abatement was delivered independent of economic contraction, abatement was less expensive than projected and there was no statistical evidence of decreased competitiveness or of industries fleeing the EU because of the EU ETS. The price decrease in the course of 2012 and 2013 showed the flexibility that cap-and-trade provides, by minimizing the impact of the program on a weak economy, while still delivering abatement to the capped level. A straight carbon tax would not have had this adaptability without direct government intervention to reduce the tax burden. This is important evidence for California and other developing carbon markets in support of their own programs and as a reference for what can be improved.

Getting the Allocation Right

A successful carbon market must be designed and implemented with a scarcity of emissions allowances sufficient to give a price to carbon that drives the low-carbon investment necessary to enable future target levels of reductions to be met. Over-allocation of allowances to covered entities leads to a lack of demand and therefore a low price for allowances which in turn causes a delay in investment in low-carbon technology and innovation. The risk is that, while the ever tightening cap provides the prospect of future scarcity, the market may fail to take prospective obligations into account when setting the carbon price, due to significant regulatory uncertainty over the size and timing of future caps. The timing and method of allocating EU Allowances ("EUAs") in the EU ETS has been politically sensitive and unforeseen events such as the global financial crisis of 2008 have made it a challenge to retrospectively get the allocation right.

Before the start of the EU ETS, the European Commission (the "Commission") did not have accurate information on all Member States' GHG inventories to allocate EU allowances to installations. In Phase I of the EU ETS, Member States were therefore required to produce National Allocation Plans allocating EUAs and some allocations were based on installations' estimates of business as usual projected emissions. As Member States were overly generous to industry, this lead to an over-allocation of allowances in the pilot phase of the EU ETS Phase I (2005-2007) leading to a sharp price decrease in 2006 when actual emissions data was made public. The Phase II (2008-2012) allocation of allowances was based on the actual emissions data collected in Phase I (2005-2007). The Phase II allocation created a thriving carbon market that was worth approximately EUR106 billion in 2011 .

In contrast to the EU, Californian companies were already required to report their emissions pursuant to mandatory reporting obligations prior to the cap being set and the allocation of allowances. California had accurate and verified emissions data upon which to base the cap and was therefore able to better mitigate the risk of over-allocation due to

data gaps. Access to data, of course, does not necessarily eliminate over-allocation due to political pressure from industry.

Banking

The Phase I EUA price crash primarily arose because operators were not permitted to bank Phase I EUAs into Phase II, thus valuing any overhang Phase 1 EUAs at zero. By contrast, California has permitted banking into and borrowing from future periods of the California cap-and-trade program from the outset, subject to holding limits. This is a reflection of the lessons learned from the EU ETS experience and should provide more long-term price certainty .

Auctioning

In the EU ETS, energy-intensive sectors have been granted free allowances in the initial phases of the cap-and-trade-scheme. Allocation of free allowances at the outset of the scheme followed by a phase of increased auctioning appears to have been a successful strategy to secure initial support for the scheme. In EU ETS Phase I many entities awarded free allowances enjoyed windfall profits from EUAs they were able to sell into the market due to the over-allocation of EUAs described above, as they did not require them for compliance purposes. In its third phase, the EU ETS has moved to auctioning allowances for all of the power sector. Auctioning allowances encourages an efficient distribution of allowances. California has implemented a mixture of auctioning and free allocation from the outset of its program which should decrease the likelihood of windfall gains for operators.

Security

The principle of open participation in the EU ETS was challenged when the EU ETS suffered a number of security issues between 2009 and 2010. Criminal activities involving VAT fraud, phishing of EUAs and recycling of surrendered EUAs highlighted inadequate security measures in some EU registries. In response, the EU suspended registries until harmonised security measures were complied with by all Member States, which was completed in 2011. California has adopted some of the security features the EU ETS introduced to deal with the security challenges including, for example, requiring an extensive amount of documentation evidencing the identity of prospective accountholders to open a registry account. The process of transferring compliance instruments through the Californian registry requires authorisations by multiple parties transferring instruments but also by the party receiving allowances. While this may not completely prevent cyber-crime, it adds an element of delay and second level verification which may increase the likelihood of detection of any criminal activity.

Credibility of Offsets Use

The use of offsets to complement the supply of tradeable allowances is an important mechanism to ensure an economically efficient supply of compliance instruments is available in the market, to meet demand and to maintain competitiveness. The veracity of the emissions reductions made to generate the offset is key to preserving overall environmental integrity. In response to criticisms of the legitimacy of particular categories of international offsets for EU compliance, the EU ETS has tightened its qualitative criteria progressively since Phase I to determine which international offsets may be used for EU compliance.

The ARB Regulations have implemented strict rules on the admissibility of offsets. Stringent protocols governing the monitoring, verification and issuance of offsets must be met and only a small number of methodologies have been approved (ozone depleting substances, livestock, forest and urban forest projects) either as ARB offsets or through ARB-approved early action offset programs (American Carbon Registry, Climate Action Reserve, Verified Carbon Standard). Covered entities are also only allowed to use offsets to fulfil 8% of its compliance obligations. As such, the main focus of the California cap-and-trade regulations is still on the abatement of emissions, rather than on the use of offsets.

No Market is Perfect

Following the recession, Phase II of the EU ETS became seriously over-allocated. This was in part because the cap was based on Phase I (2005-2007) data when the economy was strong, well before the recession, but also due to the success of complementary renewables support and energy efficiency measures leading to reduced demand in the market. Although there is a mechanism in the Directive for excessively high prices there was nothing to deal with (arguably) excessively low prices. There is also uncertainty surrounding the EU cap beyond 2020. Although the EU ETS Directive states that the cap will decrease year on year by 1.74%, the Commission is expected to revise the cap by 2025 at latest and it is unclear whether this revision will require deeper emissions cuts.

The EU is in the process of agreeing an approach to address over-supply of allowances through holding back EUAs from the auctioning schedule, to be re-introduced near the end of Phase III.

California already has in place a number of price containment features designed to help the market function in a predictable way including but not limited to: the auction price floor, auction price cap and holding limits. An ongoing challenge is the impact of complementary measures to the cap-and-trade program, the exact impact of which is difficult to predict. The success or failure of complementary policies such as the Low Carbon Fuel Standard, or wider energy efficiency programs will strongly impact carbon pricing in California. These unknowns may be the California carbon market's biggest challenge yet.

Strong foundations

California's cap-and-trade program is a robust scheme and enjoys the benefit of looking back on mistakes made in the design of the EU ETS. It is clear that California has incorporated and refined EU learning, setting its cap and allowance allocation based on verified emission data, allowing banking through periods, ensuring a significant proportion of allowances are auctioned, applying strict security measures for account holders, enforcing stringent offset usage rules and providing for various price containment measures. These early years may bring unforeseen challenges to the California market but at the outset, it appears to have set down strong foundations to withstand them.

(Endnotes)

[1] Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003, established the scheme for greenhouse gas emission allowance trading within the European Community / [2] See Ellerman, Convery and Perthuis, Pricing Carbon, Cambridge Press (2010) and Brown, Hanafi and Petsonk, The EU Emissions Trading System: Results and Lessons Learned, Environmental Defense Fund (2010). / [3] Ellerman, Convery and Perthuis, Pricing Carbon, Cambridge Press (2010) at 243 / [3] McKinsey and Company & Ecofys, EU ETS Review: Report on International Competitiveness European Commission, Dec 2006; and Reinaud, Industrial Competitiveness under the European Union ETS, International Energy Agency, Dec 2004 / [4] See www.theice.com/publicdocs/futures/ICE_Monthly_Utility_Report.pdf / [5] Numerous stakeholder consultations, scoping papers and presentations conducted over the course of the development of the California cap-and-trade program refer to elements of and pricing in the EU ETS. / [6] See Ellerman, Convery and Perthuis, Pricing Carbon, Cambridge Press (2010). / [7] Ibid.at 143. / 8 Kossoy, Alexandre and Pierre Guigon (May 2012) "State and Trends of the Carbon Market 2012," World Bank. / [9] See ARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (title 17, California Code of Regulations, Sections 95100-95157) / [10] Section 95922, California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms, codified at Cal. Code Regs., tit. 17, Sections 95800 to 96023, as amended ("ARB Regulations"). / [11] Ibid. Sections 95856(b)(A) and 95856(b)(B). Borrowing is only permitted to meet excess emissions obligation or if purchased from the Allowance Price Containment Reserve. / [12] Holding accounts are subject to Holding Limits calculated as follows: 0.1*Base+0.025*(Annual Allowance Budget – Base), where "Base" = 25millmetric tons of Co2e, "Annual Allowance Budget" is the number of California GHG Allowances issued for the relevant year (Ibid. Sections 95920(d) and 95920(e)). / [13] It should be noted that even now that the EU ETS permits banking between periods, the level of over-allocation is so significant that the price of Phase III EUAs is still extremely low and most market participants do not expect the price to recover to around €10 until the end of Phase III (see IETA GHG Market Sentiment Survey 2013). / [14] Section 95834 ARB Regulations. / [15] Section 95975, ARB Regulations: The ARB Regulations set out holding limits for the maximum number of California GHG allowances that may be held by an entity or jointly held by a group of entities with a direct corporate association. The holding limit differs for each entity as it is calculated by taking the annual allowance budget into account. / [16] Section 95990, ARB Regulations. / [17] Release # 12-60, "Air Resources Board Sets Stage or Carbon Offset Projects," December 14, 2012 / [18] Over-supply of compliance instruments to the market was also due to the scaling up of the Clean Development Mechanism and Joint Implementation as a source of Certified Emissions Reductions or "CERs" and Emissions Reduction Units or "ERUs". / [19] Article 29a, ETS Directive, allows for supply-side adjustments in the event of the ETS price tripling over a six month period, whereby auctioning of EUAs could be brought forward. / 20 Article 9, ETS Directive / [21] Section 95911: The ARB Regulations have set an Auction Reserve Price of $10 per allowance for allowances auctioned in 2012 and 2013 as well as for advance auctions conducted in 2012 for vintage 2015 allowances. All auctions must be conducted using an Auction Reserve Price and allowances will not be sold at bids lower than such price. The Auction Reserve Price is increased by 5% of the auction price for the previous calendar year plus by the rate of inflation. / [22] Section 95913, ARB Regulations: The ARB Regulations contains an Allowance Price Containment Reserve available to California covered entities and opt-in covered entities in quarterly reserve sales. The Reserves for 2013 are divided into three tiers, which are sold for $40, $45 and $50 per allowance, respectively. The Reserve Tier Prices are increased by 5% of the auction price for the previous calendar year plus by the rate of inflation.

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Chris Staples advises leading corporates, banks, funds and governments in relation to environmental commodity market driven investments. He has advised on the most significant M&A transactions in the carbon finance sector including JPMorgan's acquisition of ClimateCare, Barclays acquisition of Tricorona and investments in Climate Change Capital, South Pole Asset Management Ltd. and Bluesource LLC. His transactional expertise includes advising in relation to ISDA, EFET and IETA based carbon trades, emission reduction project off-take agreements, biomass supply agreements, silicon supply agreements, carbon linked bonds and structured products, and also involves advising clients in relation to the allocation management of climate change related risks arising in public and private acquisitions, financings and investments. He has advised IFC in relation to its Post 2012 Fund, several investment banks in relation to Post 2012 trading documentation.

Nandini Sur advises corporations on the environmental aspects of M&A transactions such as stock purchase deals and has also advised in relation to emissions reductions purchase agreements in the California market.

Linklaters

THE BRIDGES

ALIGNING MARKETS
WITHIN A FRAGMENTED
ARCHITECTURE

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CARBON PRICING, THE FVA AND THE NMM: CHARTING A COURSE TO A NEW UNFCCC AGREEMENT

In the early days of climate policy development, the implementation of carbon pricing within the global energy system was seen as a core requirement for solving the issue of rising levels of CO_2 in the atmosphere. After all, this had solid economic backing from leading academics and following the implementation of a cap-and-trade system, and therefore price, for sulphur dioxide emissions in the USA was regarded as a natural extension of the same idea but to a bigger problem. Carbon pricing, ideally through cap-and-trade, was recognised as the most efficient route forward for resolving this particular environmental issue. The broader its application, the lower the overall cost of mitigation would be.

In 1997 the Kyoto Protocol was agreed at COP 3. Central to its implementation was carbon pricing, delivered through a trading component. This was underpinned by a critical design element, the Assigned Amount Unit, or AAU. This is the functioning market mechanism within the Kyoto Protocol and acts in the same way as an allowance in a cap-and-trade system. The AAU provides a basis for trade and creates supply and demand through its allocation against national targets relative to actual emissions. This gives value to the AAU, which in turn creates demand and value for Certified Emission Reduction (CER) units under the Clean Development Mechanism (CDM). Without the targets underpinned by the AAU, the CER and similar instruments have no value and could not exist in a meaningful sense.

Over the subsequent 15 years, those that have adopted the Kyoto Protocol have cascaded its obligations into their economies and in many instances have linked their domestic policy frameworks with the AAU. The EU, Australia and New Zealand all developed trading systems which either directly or indirectly are AAU compatible, which also means that the potential to link them has been created. For example, Norway easily joined the EU ETS, as both economies sit under the AAU structure and Australia and the EU announced their intention to link their respective trading systems. Although that particular linkage was announced as a bilateral arrangement, in reality it is only possible because of the underlying AAU structure. Both governments knew that they had systems designed under the same rule structure and both systems already recognized the same external mechanisms, such as the CDM of the Kyoto Protocol. The existence of the AAU also meant that compliance against independent national goals would be transparent even though the linkage existed.

Although it is now fading into the annals of history, the structure of the Kyoto Protocol had the potential to lead to the formation of a robust global carbon market, a carbon price embedded in much of the global energy system (assuming countries had progressively moved onto the Annex B list) and therefore an economically efficient approach to emissions mitigation. Unfortunately, this is not to be.

> Although a single global pricing architecture would always be preferable, politically that isn't a current reality

A new approach to mitigation

The discussions that have taken place since COP 13 in Bali have focused on a more bottom-up approach to mitigation, with national governments pledging to manage emissions in some manner or other on an individual basis. But this is a discussion in parts, rather than tackling the issue more holistically through a robust economic model. Further, such an approach will not necessarily result in a reduction in global emissions, particularly where global carbon pricing is not involved or is not heavily featured through policy design. For example, a national strategic focus in areas such as energy efficiency and renewable energy deployment but without carbon pricing is an approach adopted by some and offered as a mitigation pathway. This may well address issues such as energy cost and access, but won't necessarily

displace fossil fuels to the extent that there is a permanent reduction, both geographically and temporally, of some amount of carbon emissions to the atmosphere.

Even national actions that result in direct emissions management can have high leakage rates when carbon pricing is not robustly adopted in other areas. The USA is a good example of this. As lower emitting natural gas has arrived on the domestic scene and older (and new) coal plants face potentially costly EPA-led pollutant regulations (which may include CO_2 regulation), that natural gas has rapidly displaced coal in the generation mix and US emissions have fallen. But coal production has been less effected, as some of the same coal that would have been used domestically has simply been shifted geographically through export to regions where direct carbon policies are insufficiently developed. US coal exports have doubled over the past decade and the total carbon released to atmosphere as a result of US coal and natural gas production has increased.

Underlying global energy demand is now so strong that marginal production of fossil energy from existing facilities will simply continue, even if displacement is forced in some areas. Until real carbon pricing permeates the global energy system and is seen as the new normal, global emissions are unlikely to be reduced irrespective of the number of national pledges, energy mix directives, energy efficiency drives and renewable energy subsidies.

Can a global carbon market still emerge?

Without an architecture specifically designed to cascade carbon pricing into the global economy, arguably there is little hope of seeing a real reduction in global emissions. It is also very clear that such a policy framework is off the table in the current round of negotiations. But perversely, there is growing national interest in using carbon pricing and tradable carbon emission instruments, althought this interest needs to be accelerated into real implementation and adopted more widely.

The UNFCCC can play a valuable role in this regard. Two current lines of discussion within the negotiating process could be directed more constructively to foster the development of a global market, even with the overall agreement still based on a pledge-based architecture. These are the Framework for Various Approach (FVA) and the New Market mechanism (NMM).

A market mechanism describes a process by which a market solves a problem of allocating resources, especially that of deciding how much of a good or service should be produced, but other such problems as well. The market mechanism is an alternative, for example, to having such decisions made by government. Rather, it represents the interaction of supply, demand and prices. In the context of emissions mitigation, the trading structure within the Kyoto Protocol illustrates the part played by the market mechanism. As already noted, the functioning market mechanism is the AAU – not the CER as some will argue. The NMM should be modeled on such a design, in effect replicating the role of the AAU under the Kyoto Protocol, but operating in a world of bottom up pledges, nationally designed trading systems and NAMAs – in other words, a series of various approaches operating within a common framework (the FVA). This design for the core NMM instrument would also give renewed value to the CER and allow the development of additional crediting mechanisms within a new framework. Simply using the NMM to implement further crediting opportunities (e.g. so called sectoral crediting), as some are currently proposing, will not create a viable carbon market – something different has to happen.

A stepwise approach to the goal of a global carbon market could be envisaged, through an arrangement that allows linkage between approaches within the FVA, utilizing the NMM as the common carbon currency. A national, sub-national or sectoral level approach recognised under the FVA may choose (voluntary opt-in) multilateral participation in the developing global carbon market by accepting a fixed carbon emissions budget for a given future period in the form of tradable international allowances (NMM units). The budget arises from the goals of the specific policy program(s) as a contribution to the global effort. The budget is fixed (i.e. absolute), irrespective of the nature of the mitigation programme operating within the economy.

For approaches in which domestic units are not expressed in CO_2 terms, the national government could still accept a comparable NMM unit allocation, which then serves as a route for conversion of the domestic unit to a tradable international carbon unit. Such a conversion mechanism provides additional fungibility by facilitating linking beyond emissions trading to include Renewable Energy Certificates (RECs) and other trading approaches not explicitly denominated in CO_2 terms.

However, under this approach, governments would take the risk of any conversion of units that are not measured in CO_2 terms and NMM units which would have a CO_2 denomination. Such a conversion mechanism would always exist under the authority of a national government and it would be responsible for establishing what types of units could

be transferred in and out of a national system.

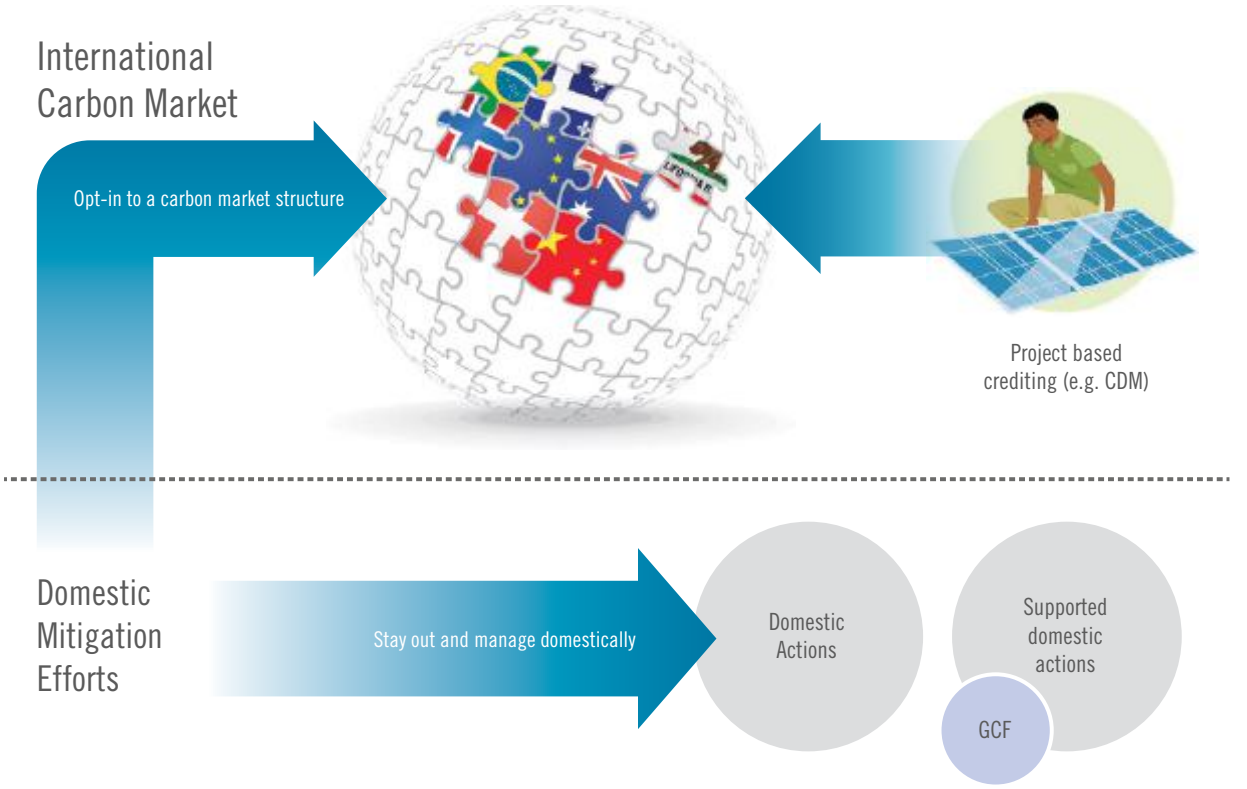
Any conversion to NMM units would also need to be agreed upon at the international level through the body recognizing FVA submissions when each Party submits its scheme.

Participation in this model is not mandatory, but once in, participants must fulfill their commitments and meet their agreed emission budgets through the surrender of NMM units. Participation would always be dependent on a review of the carbon budget submission by an oversight body. Such an oversight body could either fall under the UNFCCC, or be independent of the UNFCCC (e.g. a Board elected by countries participating in the market).

Conclusion

Although a single global pricing architecture would always be preferable, politically that isn't a current reality. Nevertheless, that shouldn't be cause to lose sight of the goal of global carbon pricing, particularly given that without it the emissions issue is unlikely to be resolved.

The FVA and NMM discussions could be structured to deliver such an outcome, which over time should deliver the necessary critical mass for change.



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THE LINKING RAINBOW: EVALUATING PARALLEL APPROACHES TO JOINING CARBON MARKETS

The authors would like to thank the organisers (IETA, RFF and UC Davis) and participants of "California Linking Through 2020: The Golden State's Role in the Development of Carbon Markets" held at UC Davis on September 18th 2013 in Sacramento—which contributed ideas further developed in this article.

A broad range of countries, states, provinces, cities and municipalities have implemented market-based mechanisms to reduce carbon emissions. These mechanisms include emissions trading systems, offsets mechanisms, nationally appropriate mitigation actions (NAMAs) and other configurations. While these mechanisms differ substantially, a common thread—one of utilising market incentives to efficiently reduce carbon emissions—runs through them.

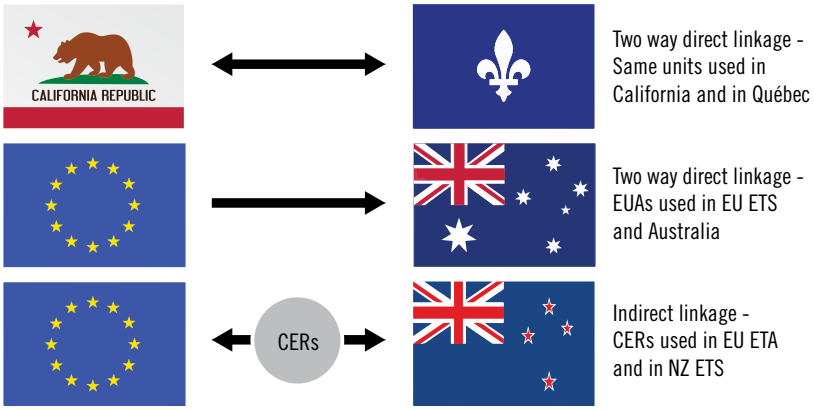
Individual jurisdictions have led the way in incorporating market-based mechanisms into climate policy. Even though some nations may have pledged reduction goals as part of the Copenhagen Accord, agreed through the United Nations Framework Convention on Climate Change (UNFCCC), legislation outside of the international process details the policies that actually achieve these reductions. The cap-and-trade (C&T) program in California provides one example in a growing trend of bottom up policymaking that does not rely upon the international architecture of the Kyoto Protocol to function.

Bottom-up climate policy allows individual jurisdictions to tailor regulations to local conditions but also runs the risk of leading to a cumbersome and fragmented patchwork of rules, credits, and markets for businesses to navigate. In this article, we explore various models of market or policy "linkage" as a potential solution to reduce this risk.

Linking Models

At least two models of linkage exist: "formal linkage" and "linkage by degrees." Formal linkage refers to the recognition of carbon assets between C&T systems as eligible for compliance. Linkage by degrees, on the other hand, refers to a broader process of incrementally aligning program elements between C&T programs. The term "program elements" characterises a range of design choices that regulators make when constructing a C&T system. While formal linkage represents an important program element that regulators may decide to align with other systems, it represents just one of many program elements that may be aligned during the process of linkage by degrees.[1]

FIGURE 1. TYPES OF FORMAL LINKAGE



ADAPTED FROM THOMSON REUTERS POINT CARBON (2013)[3]

Formal Linkage in Focus

Formal linkages can take a number of forms, including direct and indirect links that recognise allowances or offsets as eligible for compliance.[2] Figure 1 summarises the types of formal linkages available to regulators.

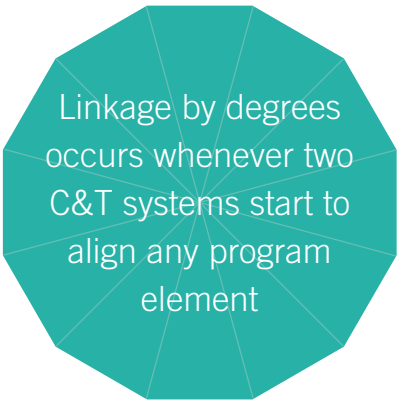
UNILATERAL LINKING TO OFFSET MARKETS

Most C&T systems choose to formally link with carbon offset markets to allow covered entities the flexibility to purchase reductions from uncovered sectors. Covered entities can purchase offsets through Kyoto Protocol markets—such as the Clean Development Mechanism (CDM) and Joint Implementation (JI)—or through a number of smaller compliance markets inspired by California's C&T system, Québec's C&T system, the Regional Greenhouse Gas Initiative (RGGI) and Australia's Carbon Pricing Mechanism (CPM).

Note: The following article reflects the views of the authors, and not the International Emissions Trading Association IETA or Resources for the Future (RFF).

UNILATERAL LINKING TO A TRADING SYSTEM

A C&T system can establish a unilateral formal link by recognising another system's allowances as eligible for compliance. The current proposal in Australia to allow covered entities to import allowances from the European Union from 2015 provides an example of a unilateral formal link.



BILATERAL LINKING BETWEEN TRADING SYSTEMS

C&T systems can also establish a bilateral formal link by mutually recognising their allowances as eligible for compliance. Without restrictions, and under certain market conditions, such a link leads to a single price across systems. The upcoming link between California and Québec provides an example of a bilateral formal link.

INDIRECT LINKING

All of the formal links mentioned so far have been direct. Two C&T systems establish an indirect link when they recognise allowances or offsets from a third market but not credits from each other. For example, the EU ETS and New Zealand have indirectly linked through the Clean Development Mechanism (CDM). In this example, however, a price differential exists between the two markets due to the restrictions on certain types of CERs imposed by the EU from January 2013 onwards. Therefore, New Zealand allows access to a wider pool of CERs than the European Union but there are still certain CERs available to both systems. In the absence of these types of restrictions, indirect linkage could lead to a single offset price in the two original C&T systems even though they have not directly linked.

Linkage by Degrees as a Complementary Process to Formal Linkage

Linkage by degrees can prepare two C&T systems for formal linkage. The misalignment of some policies (rules surrounding measurement, reporting and verification—known as MRV rules—or certain cost containment mechanisms) can provide a barrier to formal linking. Aligning such policies makes the success of formal linking more likely, paving the road for regulators to authorise allowance trading between jurisdictions. California and Québec have successfully followed this approach.

Linkage by degrees occurs whenever two C&T systems start to align any program element. Program elements include: (1) technical issues, such as MRV rules and platforms for tracking allowances; (2) the stringency of reduction targets; (3) methods for allocating allowances to covered polluters; and (4) whether to establish cost control measures. Whenever two C&T systems start to align any one program element, they have engaged in linkage by degrees.

Take the example of price floors. California's C&T system has a price floor with two main features: (1) an initial price equal to USD10 that grows at a (2) rate equal to 5%, plus the rate of inflation as calculated by the Consumer Price Index (CPI). A hypothetical Chinese C&T system could link by degrees with California by aligning to California's price floor design—even without allowance trading. China's adoption of California's initial price levels, 5% growth rate and process to account for inflation in that growth rate would each constitute an instance of linkage by degrees. Table 1 below provides an illustration of this process.

A Renewed Focus, and Call for, Linkage of Carbon Markets

Analysts have long viewed formal linkage as critical in achieving a global carbon market. A key principle of IETA and its members is to create a global framework for emissions trading, and formal linkage represents an important step toward that goal.

Formal linkage provides two important benefits that aligning other program designs cannot solely achieve: lowering overall abatement costs and lowering overall allowance price volatility. While these benefits justify analysts' focus on formal linkage, they also may not be sufficient to convince every jurisdiction to formally link because trading allowances also has potential costs.

For example, focusing on distributional outcomes, as opposed to strictly efficient outcomes, there are potential costs associated with allowance trade. A particular firm may be a permit-seller

No Linkage by Degrees Between C&T Systems → **Fully Aligned C&T Systems**

Program Element	A	B	C	D	E
Price Floor	No alignment	Both systems have price floor	Systems align initial price floor levels	Systems align initial levels and growth rates	Systems align initial levels, growth rates and inflation rates

before regulators establish a formal link but, after that formal link begins, may become a permit buyer due to a lower overall allowance price. In this case, the market has certainly achieved lower overall abatement costs but at the expense of that particular firm.[4] In addition, academic debate continues over the potential impact of allowance trade on cap-setting.[5]

Aligning program elements through linkage by degrees, however, can achieve many of the other benefits typically associated with formal linkage. Both formal linkage and linkage by degrees can achieve the following categories of benefits:[6]

Political Benefits – Formal linking demonstrates a common commitment to reducing emissions. But aligning other program elements—including, for example, aligning reduction targets, price floors and offset protocols—can also send this signal even before allowance trading commences. Moreover, the decision to formally link occurs once and therefore provides only a single opportunity to demonstrate common commitment. Publicising the alignment of other program elements provides more opportunities for jurisdictions to express a common commitment toward reducing emissions.

Economic Benefits – While linkage by degrees cannot lower overall abatement costs or allowance price volatility, it can reduce concerns over leakage and competitiveness—a benefit typically associated only with formal linkage. For example, regulators could reduce leakage and competitiveness concerns by aligning cap levels, sectoral coverage and methods for compensating energy intensive and trade exposed industries. Even before formal linking, this strategy could prove especially effective for jurisdictions geographically close to one another.

Administrative – Formal linkage can also provide administrative efficiencies to businesses operating across multiple jurisdictions and regulators establishing or reforming C&T systems. Aligning other program elements besides policies related to formal linkage also provides these benefits.

Linkage by degrees, moreover, provides some benefits that formal linkage alone cannot achieve. For example, the alignment of complementary measures—like renewable portfolio standards, which impact allowance prices—and methods for estimating achieved emission reductions could help two C&T systems accurately compare stringencies. In a United States context, states might earn greater deference under the Environmental Protection Agency's forthcoming regulations for existing power plants if they align successful complementary measures as well as methodologies for past and future emissions reductions.[7] This greater deference could translate into greater state sovereignty over its climate policy and potentially to greater compliance flexibility.

Linkage by degrees does not come without costs. Care must be taken to align to well-designed program elements. Alignment to poorly designed program elements could act to quickly propagate these designs and might end up contaminating carbon markets.

Conclusion

A focus on linkage by degrees helps clarifies the benefits unique to formal linkage and linkage by degrees—as well as those benefits that both forms of linkage can achieve. It is clear that regulators can—and have, in the context of California and Québec's approach—used these two processes as complements to secure a broad range of benefits. We argue that, when stakeholders remain mindful of both forms of linkage, the advent of a global carbon price becomes much more likely.

(Endnotes)
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IETA
INTERNATIONAL EMISSIONS TRADING ASSOCIATION

RESOURCES FOR THE FUTURE

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JAPAN'S JOINT CREDITING MECHANISM: A BOTTOM-UP CDM

The Joint Crediting Mechanism (JCM) is a policy response by the Japanese government to contribute towards the reduction of the emissions globally. The government has accelerated the preparation of JCM after COP18, when Japan declared it would not enter the second commitment period of Kyoto Protocol. As of the end of August 2013, Japan has JCM agreements with 8 countries.

TABLE 1: PROGRESS OF JCM PARTICIPATION

JCM Step	Progress/Remarks
Framework Agreement (MOU)	Mongolia(Jan/2013), Bangladesh(March/2013), Ethiopia(May/2013), Kenya(June/2013), Maldives(June/2013), Vie Nam(July/2013), Laos(August/2013). Indonesia(August/2013)
Joint Committee	Agreed Guideline with Mongolia(April/2013), Bangladesh(pending), Ethiopia(August/2013), Kenya(August/2013).
Project development	Japanese government provides programs for FS support, Investment cost support and verification cost support. Investment cost support METI : As a part of technology diffusion support program MOE : A half of investment cost will be support, provided that a half of reductions should be transferred to Japanese government
Validation and Verification	Third Party Entities(TPEs) is needed. Application for TPEs are open.
Issue of credit	Registry at both countries is to be constructed. JCM starts as "Non-tradable"
Demand for JCM	Not appeared explicitly yet

The JCM is a separate track from the UNFCCC's Clean Development Mechanism (CDM) but has very similar governance and procedures as the CDM. The main objective of the JCM is the development of reductions in previously unused areas, particularly energy saving which has not been supported well by CDM. This is achieved by diffusing low carbon technologies, products, systems, services and infrastructures. The Japanese government stated JCM is a supplemental to the CDM for reducing emission globally.

Structure of JCM

The first step for the JCM is the signing of an agreement with a host country government - Memorandum of Understandings (MOU). Mongolia was the first country to sign an MOU (January 2013) and then Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Laos and Indonesia followed.

JOINT COMMITTEE: The centerpiece of the governance of JCM is the Joint Committee (JC) which consists of the representatives of both governments. The JC has responsibility for the determination of the guidelines necessary for the implementation of JCM; approval of methodologies and projects, and issuance of JCM credits. The CDM is a very centralised but global scheme, whereas the JCM is decentralised because the rules of JCM take into account local conditions, and the JCM is implemented country-by-country.

GUIDELINES: The JC for Mongolia and Japan decided guidelines and other documents necessary for implementing JCM. Below are the major documents produced:

- Rule of procedure of JCM
- Project cycle procedures
- Guideline for developing methodology
- Guideline for third party entity
- Guideline for Project Design Documents (PDD) and monitoring
- Guideline for validation and verification

Guidelines may be modified, depending on the host country's local conditions, but Japanese government intends to use these documents as the standard of documents for other countries, to harmonise the JCM.

VALIDATION AND VERIFICATION: Third party validation and verification is required, and it is stated that Designated Operational Entities (DOEs) for CDM and

ISO-accredited entities are eligible. Application for designated third party entities for JC are being accepted now.

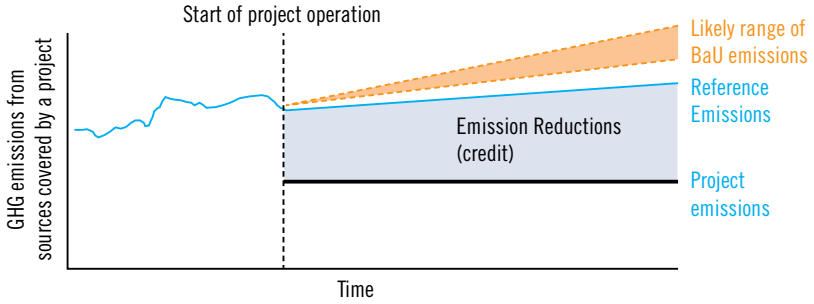
REGISTRY: The JCM registry will be constructed at both countries. It is assumed that private entities and the Japanese government will open their account in the JCM registry, and the private company can transfer credits from their account to government account. The Japanese government has designed JCM as a "non-tradable" system to avoid complicated legal settings and establishing trading infrastructure. They also paid attention to the negative response from some industrial groups against "trading".

Project development

The Japanese government supports the development of potential JCM projects through three types of support programs; feasibility study support, investment cost support and transaction cost support. The JCM is moving to the project development phase because, firstly, feasibility of many projects have been completed through programs by Ministry of Economy, Trade and Industry (METI), Ministry of Environment (MOE) and their related institutions and, secondly, the Japanese government has signed MOUs with 8 countries. The Japanese government has put a higher priority on the support of investment cost and transaction cost, including for the validation and verification processes.

METI supports potential JCM projects by using technology diffusion support program of New Energy and Industrial Technology Development Cooperation (NEDO). This program intends to support the pilot projects which deploy cutting edge technology, and is mostly limited to the first project that uses the technology in the host country. The first tender in 2013 was limited for projects in Mongolia and Bangladesh, and one project in Mongolia was selected as of the end of August. The second tender was closed in mid-September.

FIGURE 1: IMPACT OF JCM PROJECTS ON EMISSIONS AND CREDITING BASELINE



(SOURCE) "JOINT CREDITING MECHANISM GUIDELINE FOR DEVELOPING PROPOSED METHODOLOGY" (MONGOLIA), GOVERNMENT OF JAPAN

MOE started a new scheme to support potential JCM projects by providing incentives equivalent to half of investment cost, provided that half of the verified reductions shall be transferred to the Japanese government's account. By the first tender, 5 projects are selected;

- Indonesia ; High efficient air conditioner at manufacturing facility
- Cambodia ; Small biomass power generation using sterling engine
- Bangladesh ; Bricks manufacturing without sintering process
- Viet Nam ; Energy Management at Brewery
- Mongolia : Modernization of Combined Heat and Power (CHP)

Methodology of emission reduction calculation

The JCM aims to develop unutilised reduction space, particularly in energy saving, by using advanced but practical technology. Monitoring, Reporting and Verification (MRV) is crucial. Guideline of "MRV Development" says that "emission reductions to be credited are defined as the difference between reference emissions and projects emissions", and "the reference emissions are calculated to be below business-as-usual (BaU)" in order to realise "net reduction". But we have learned from the CDM that it is not easy to determine the level of BaU of energy efficiency projects.

The Japanese government, particularly METI, stressed that benchmarking of energy efficiency is an option for the baseline emission (reference emissions). This is because it is measurable and transparent, and also practical for investors to achieve the energy efficiency improvement. When an energy efficiency standard is accepted as reference emission, it is not only convenient for investors but also very efficient for reducing emission globally.

Each methodology shall be developed by project developer and approved by Joint Committee. It is described that the JC may have expert groups for supporting JC activities and this would be a practical option for talking about energy efficiency standard as a reference. It is better for expert groups to consist of technology, policy and financial experts who have experience in project development.

Demand for JCM Credits

Japan did not submit a reduction target for the second commitment period, but it is obvious that Japan continues to make efforts to reduce domestic emissions and contribute to supporting emission reductions in developing countries.

Prime Minster Shinzo Abe said that the "25% reduction target shall be reviewed and show a new and adequate target before COP 19". However, the strategy for long term energy structure, after the Fukushima nuclear power accident in 2011 has not been determined yet. It is difficult to determine the appropriate reduction target in 2020 and beyond without setting the role of nuclear power. It is said that a range of reduction targets is a possible option under the current situation (as of the end of August 2013)

It is assumed that there are 2 types of credit demand potentially; from the Japanese government and the private sector. Half of the reductions which are supported by CAPEX support program by MOE will be transferred to the government account. Its budget in FY2013 is JPY 1.2 billion and MOE submitted FY2014 budget plan that increases to JPY 10.5 billion. The amount acquired by the government is expected to be increased though investments.

Other potential demand is from the private sector, particularly from the power sector. Under the first commitment period of the Kyoto Protocol, the power sector acquired approximately 200 million tons, and was the biggest buyer of credits in Japan. The carbon emission factor of power in Japan has increased by more than 0.1ton/Mwh compared to before the nuclear accident because only 1 of 50 nuclear power plants is being operated now, and the shortfall of electricity is fulfilled mainly by fossil fuel power - including newly installed single gas turbines. Emissions from industry has increased even though their efficiency is improved. Industries expect to lower the emission factor although they fear increased the electricity bills.

"CDM and JCM" or "Just JCM"

The Japanese government stated that the JCM is designed as supplemental to the CDM. However, access to CERs for Japan is limited because Japan did not enter into the second commitment period. The Japanese government's position toward the use of CER has not been changed. The pros and cons of JCM compared with CDM are presented below.

PRICE/COST: The cost of reductions per ton under CAPEX support program by MOE is likely to be higher than that of CER. This is good as an investment support instruments, but a big economic burden for offset users (taxpayers and industry).

AVAILABILITY OF CREDITS: The lead time for investment needs to be considered. Not a lot of projects have applied to CAPEX support project, and it is likely to generate limited amount of reductions by 2020. Both "JCM and CDM" are likely to be used when demand for offset credits rises.

Conclusion

The Japanese government will strengthen the support for potential JCM projects by getting a bigger budget in 2014 because a post-2020 climate framework shall be agreed in 2015 at COP 21, and Japanese industry and economic group support JCM as a technology driven approach. The biggest uncertainty is demand for JCM credits, and the policy debate of long-term energy strategy will be key.

About the Author(s):

Takashi Hongo has been involved in environment projects and the consideration of environment policy measures such as climate change, water shortage, low carbon urban development and bio diversity. He has rich experiences at international project finance such as power, energy, transport and industrial projects when he served for Japan Bank for International cooperation (JBIC). He initiated various carbon related financial instruments such the "GREEN + J-MRV" by using these experiences. Recently he focused harmonization of the decentralized Asian Carbon Market including Joint Crediting Mechanism (JCM) and reforms of the financing for the low carbon economy using MRV such as Performance Base Incentive Scheme. He has contributed knowledge for the International Energy Agency, IPCC, UNEP, GLOBE International, ADB and APEC in addition to Japanese government and local authorities through various committees. He has written numerous articles as well.

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PMR Secretariat

THE WORLD BANK'S PARTNERSHIP FOR MARKET READINESS LESSONS FROM THE PMR'S FIRST YEARS AND LOOKING FORWARD*

The Partnership for Market Readiness (PMR) was established to support countries that are interested in using market-based approaches to pursue low carbon development. Since it began operation in April 2011, the PMR, which consists of some of the world's largest economies and major actors in climate change mitigation, has become one of the key forums to support carbon pricing initiatives and other cost-effective instruments to scale up mitigation efforts.

The PMR's sixteen Implementing Country Participants receive preparation grants to create a Market Readiness Proposals (MRP). Through the MRP, each country provides a roadmap to evaluate and develop market-based approaches to reduce greenhouse gas (GHG) emissions, such as emissions trading, carbon taxes, or crediting mechanisms. Some countries also include plans for program piloting. As of June 2013, five countries have finalised their MRPs and received additional funding in order to implement the activities included in their proposals. Chile, Costa Rica, Mexico, and Turkey were granted USD 3 million each; China received USD 8 million.

Lessons from the PMR' First Years

The PMR started against the backdrop of a downturn in the international carbon market. At the same time, however, several developing and emerging economies expressed strong interest in exploring market-based approaches or carbon pricing instruments to cost-effectively mitigate GHG emissions, in a manner compatible with their development objectives.

Despite their interest, many PMR Implementing Country Participants face a number of challenges in using market mechanisms to pursue low carbon development. For example, most countries are at an early stage of policy formulation, and still require significant support to build and strengthen the policy, technical, and institutional components needed to establish market-based instruments. In particular, the lack of reliable data and the absence of a solid MRV system are two major challenges faced by PMR Implementing Country Participants. Whether a country's interest is to set mitigation goals, launch a domestic emissions trading system (ETS), or develop a domestic or international crediting mechanism, all activities rely on the availability of accurate and reliable data.

Another readiness challenge is the degree to which countries have undergone economic and policy analysis to inform selection and introduction of a carbon pricing instrument. Modeling economic implications of an ETS or carbon tax and analysing the interaction of these policy options with other, existing policies, such as energy efficiency standards and/or renewable energy regulation, provides a sound basis to help countries make informed decisions on the choice of a carbon pricing instrument. Such analyses also serve as key inputs into communications and engagement with stakeholders.

In addition to identifying challenges facing Implementing Country Participants, the PMR's experience also demonstrates that a collaborative partnership is a key to success. The PMR has gathered a critical mass of key market players central to the task of tackling global emissions. It is a forum in which governments openly discuss plans, opportunities, and challenges for mitigation, and candidly share experiences and lessons with past actions. The genuine effort to ensure a collaborative and open process, with discussions focused on substance and technical aspects, is a critical aspect of the PMR.

Lastly, the PMR's experience shows an interest among developing countries and emerging economies to explore a range of instruments to achieve their mitigation goals. The initial scope of the PMR focused on domestic ETS and scaled-up crediting mechanisms (including domestic offset/crediting mar-

kets). Since 2011, it has widened to include carbon taxes, energy efficiency trading schemes, and potentially other instruments. This evolution reflects an understanding that countries are diverse in their economic contexts and stages of development, and that the choice of a market-based instrument reflects a country's development strategy and priorities, its national circumstances, and its political process. Nevertheless, despite divergent approaches adopted by countries, there is a desire among all participants to explore and develop cost-effective instruments and to price carbon to drive investment toward green and low-carbon growth.

Looking Forward

While the PMR has evolved to support a variety of instruments, building carbon markets remains one of its key objectives. With regional and domestic carbon markets emerging, and interest in them growing, over the next several years we may see the emergence of a new global carbon market, likely fragmented in design and scale. This should not be considered a sign of regression; embedded within this fragmentation is the inevitable reflection of national circumstances combined with real prospects for linkage and integration.

The PMR sees an opportunity to facilitate the development of domestic carbon markets and could further assist countries by deepening its readiness support, broadening its scope and reach, and potentially piloting new market-based instruments. It could help countries create market infrastructures that are credible, consistent, and compatible with one another. For example, it could help develop core market components such as baselines, MRV systems, and data management and registry systems, which would build confidence in domestic schemes and promote the fungibility of various carbon assets, should markets link in the future.

The PMR has already started developing knowledge products in a number of areas with the objective of supporting a common framework. For example, after extensive consultations with experts and practitioners, it recently finalised a guidance and options document for the development of GHG baselines. With regard to MRV systems, the first PMR regional training workshop on the subject was held in September 2013 in Beijing, China, and provided useful material related to installation-level MRV. Two additional regional MRV workshops – in Latin America and one in Europe – are planned for 2014. Furthermore, the PMR Technical Work Program has finalised a technical note on offset standards.

Going forward, the PMR could strengthen its Technical Work Program through the development of additional technical guidance notes on relevant topics, which would emphasise good practices and propose common approaches. Furthermore, it could provide additional support by delivering country training workshops, road testing, and potentially organising a dedicated group of experts from the international community to offer timely support to countries and the PMR Technical Work Program.

The PMR could also enhance and expand upstream policy analysis. Many countries are at a cross roads in their decision to adopt a market-based instrument as a means to deliver their mitigation objective. For some countries, setting mid- and long-term mitigation goals and understanding the development implications of such goals are absolutely critical in their choice of instrument. The PMR could strengthen its policy support for countries by assisting with analyses on policy mapping and interaction and economic modeling for carbon pricing instruments, among other topics.

The PMR provides an important platform for a growing group of countries interested in building the carbon markets of the future. Its experience confirms the lesson that no one size fits all. The diversity of approaches pursued by countries requires, correspondingly, a diverse set of technical tools. The PMR will continue working to foster collaboration and to create and share knowledge, with the aim to support the development of carbon pricing instruments appropriate to each country context.

* This note draws from the Strategic Orientation of the Future of the PMR (Note PA7 2013-2), which is expected to be published at the end of October 2013. PMR Implementing Country Participants that receive grant funding include: Brazil, Chile, China, Colombia, Costa Rica, India, Indonesia, Jordan, Mexico, Morocco, Peru, South Africa, Thailand, Turkey, Ukraine, and Vietnam. PMR Contributing Participants that provide financing include: Australia, Denmark, European Commission, Finland, Germany, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, and United States. See www.thepmr.org for more information.

About PMR:

As the world seeks to enhance global greenhouse gas (GHG) mitigation efforts post-2012, countries are exploring innovative and cost-effective ways to scale up emissions reductions and foster financial flows, including through carbon market instruments. To support, facilitate and build "readiness" for such instruments, the World Bank established the Partnership for Market Readiness (PMR), a grant-based, global partnership of developed and developing countries that provides funding and technical assistance for the collective innovation and piloting of market-based instruments for GHG emissions reduction. In addition, the PMR also provides a platform for technical discussions of such instruments to spur innovation and support implementation.

pmr | PARTNERSHIP FOR MARKET READINESS

B-PMR

Business Partnership for Market Readiness

An **IETA** Initiative

Industry to Industry Dialogue on Emissions Trading & Market Readiness

Mission 1
Shenzhen/
Guangdong
March 2013

Mission 2
Seoul,
September
2013

Mission 3
Shanghai,
October 2013

B-PMR Steering Committee Member Companies:

ALSTOM · Baker & McKenzie · bp · camco clean energy · Chevron · ecoact · Enel · eex · GDF SUEZ · GreenStream · LRQA Business Assurance · Morgan Stanley · Norton Rose · pwc · Rio Tinto · Shell · south pole carbon · Statkraft · Statoil · Vattenfall · VCS Verified Carbon Standard — A Global Benchmark for Carbon

For more information on B-PMR, visit www.ieta.org/b-pmr

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THE B-PMR: ONE YEAR ON

While 2013 has been an up-and-down year for global carbon markets, IETA's B-PMR (Business Partnership for Market Readiness) has been on a continuous, upward trajectory. Since its inception in October, 2012 in Sydney, the B-PMR has undertaken two major Missions in China and Korea; a third occurred in Shanghai in late October—and more are planned for 2014 and beyond. This initiative is playing a key role to bridge the gap between private and public sectors to enable the development of robust, market-based policies for managing carbon. The B-PMR is fulfilling the critical role of building business capacity by sharing real-world experience in emissions trading, both positive and negative.

The PMR: At its core, the B-PMR was created to complement the World Bank's Partnership for Market Readiness (PMR). The PMR is a grant-based, capacity building trust fund that provides funding and technical assistance for the collective innovation and piloting of market-based instruments for greenhouse gas emissions reduction. The Partnership brings together developed and developing countries, as well as other key experts and stakeholders, in order to provide a platform for technical discussions on market instruments, foster government exchange, facilitate collective innovation for pilot efforts, and harness financial flows for implementation and scale up. The PMR supports four core objectives:

- Provide grant funding for building market readiness components such as GHG registries; Monitoring, Reporting and Verification (MRV) systems, data collection and management tools, and regulatory frameworks
- Pilot and test innovative market instruments (e.g., domestic emissions trading schemes (ETS) or new crediting mechanisms)
- Provide a platform for technical discussions and knowledge creation, South-South and North-South exchanges, and collective innovation on new market instruments
- Share lessons learned & best practices

The B-PMR: The B-PMR complements and supplements the PMR's activities in selected jurisdictions (determined by the B-PMR Steering Committee) by offering a business-to-business perspective—recognizing that business engagement is critical to effective GHG policy success. It draws from the expertise of IETA's 140+ global members, comprising major energy, industrial, financial and service companies in virtually every PMR partner region, and helps fulfill the critical role of building business capacity by sharing real-world experience, both positive and negative. B-PMR execution primarily involves Missions to host countries whose governments have invited the B-PMR to share experiences with local companies that will be covered by a new carbon pricing program. These Missions provide a forum where experts are on hand to engage in robust conversations with local industry stakeholders. They include "business-to-business" dialogues focused on key topics, such as policy assessment, market fundamentals, and evaluation of market trends and data. Other focus areas include the identification and evaluation of emissions reduction (GHG abatement) opportunities that form the basis of a market engagement strategy, technical simulations on how trades are performed on an exchange platform, as well as a review of how various trading instruments work in practice.

The expected outcome of these Missions is increased participation in and better overall performance of emerging emissions trading programs; encouragement of common approaches in such emerging trading systems, leading to better harmonization in future international policy frameworks; improved understanding by IETA Members on the directions PMR countries are taking in market design; stronger business-to-business networks in host countries; and links to the international carbon market community. Very importantly, the B-PMR creates a foundation for enduring business relationships and communication after the Missions have been completed.

First Mission: China

The B-PMR got off to a strong start in 2013 with a successful week-long mission to the Shenzhen and Guangdong

ETS pilots in China. Invited by local government leaders, the B-PMR organised a team of IETA experts from 20 companies to meet with local businesses and policymakers in southern China.

SHENZHEN: IETA partnered with the British Consulate General in Guangzhou and the China Shenzhen Emission Exchange to bring 45+ companies included in the Shenzhen pilot ETS to convene and discuss ETS impacts to Shenzhen industries on Feb. 26, 2013. The Shenzhen DRC also endorsed and supported the activity. Discussions focused on:

- EU ETS Overview: legal framework, coverage, cap setting, allowances allocation, registry, auctioning, compliance and sanctioning
- Lessons learned from Phases I and II
- Best business practice in an ETS
- MRV Experience sharing
- Trading Strategies and Carbon Asset Management

Discussions with Shenzhen industries were interactive and detailed; there were a variety of topics raised by participants and did not hold back from asking technical and politically challenging questions.

GUANGDONG: IETA partnered with the Guangdong Low Carbon Development Promotion Association and GIZ to bring 40+ companies included in the Guangdong pilot ETS to convene and discuss emissions trading for Guangdong companies from Feb. 27-March 1, 2013. The Guangdong DRC also endorsed and supported the activity. Discussions focused on:

- Preparation and participation in the EU ETS
- Lessons learned from Phases I and II
- Compliance: rules and procedures EU operators follow
- MRV Experience sharing (break out groups for the power, steel, petrochemical, cement and ceramics sectors
- Verification processes
- Registry systems and exchanges
- Trading Strategies and Carbon Asset Management

Discussions with Guangdong industries were interactive and detailed.

Second Mission: Korea

The B-PMR's second Mission took place in Seoul, Korea, at the end of September. This Dialogue, which had the endorsement of the Korea Ministry of Environment, included over 60 companies in the fields of oil/gas, power, manufacturing, buildings, automotive and others. Discussions focused on industry readiness, knowledge transfer, and policy preparation, including the following topics:

- Trading strategies and internal allowance management
- Simulating trading emissions on an exchange platform
- Allowance calculation and offset management
- MRV at the installation level: day-to-day industry best practice for MRV management
- Financial products and trading carbon
- GHG auditing and verification
- Data quality and quality control
- Offsets in the Korean ETS and challenges ahead for compliance
- The World Bank's PMR: Overview and relevance to Korean ETS participants

Third Mission: Shanghai

Building on the success of the China Missions in early 2013, a Shanghai Mission took place at the end of October. Critical to this Mission's success was the partnership with the Shanghai Development and Reform Commission (DRC), Shanghai Energy and Environment Exchange, and the British Consulate in Shanghai. Note: print deadlines precluded the inclusion of more details for this article.

The Path Forward

Looking back on 2013, the B-PMR has been a bright spot in carbon market development. By leveraging the considerable breadth of IETA's global business and market experience, it has provided a channel for robust conversations between businesses with experience of operating within emissions trading systems and those who are now commencing that learning curve. In the opinion of the authors, this communication is essential to avoiding domestic intransigence to market mechanisms and to enable local businesses to recognize the opportunities inherent in trading based GHG abatement policies. Hopefully, the B-PMR is, in some meaningful way, able to contribute to the success of the PMR in 2014 and beyond, and to the adoption in key economies of market solutions to solve environmental challenges.

Finally, the authors would like to take this opportunity, on behalf of the B-PMR Steering Committee and the wider IETA membership, to publically thank the IETA Secretariat for its hard work and initiative which has been the foundation of the B-PMR's success to date.

An IETA Initiative

About the Author(s):

The Business Partnership for Market Readiness (B-PMR) is an initiative by IETA, launched on October 24, 2012. The B-PMR hosts missions in countries that are preparing emissions trading programs. We work with local companies, governments and partners to build capacity and awareness ahead of compliance.

Mark Proegler and **Karl Upston-Hooper** serve as co-chairs of the B-PMR on behalf of our Steering Committee. The B-PMR steering committee is made up of the following companies: Alstom / Baker and McKenzie / BP / Camco Clean Energy / Chevron / EcoAct / Enel / EEX / GDF Suez / Greenstream / LRQA / Morgan Stanley / Norton Rose / PwC / RioTinto / Shell / South Pole Carbon / Statkraft / Statoil / Vattenfall / Verified Carbon Standard (VCS)

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LEVERAGING THE POTENTIAL OF THE VOLUNTARY CARBON MARKET AS A CREDIBLE TOOL FOR MITIGATING CLIMATE CHANGE

In the past year, the voluntary carbon markets have demonstrated resilience in adverse economic and political conditions, with invigorated interest from multinational corporations and governments who have turned to the markets to innovate their own carbon policies and practices. The industry will see continued growth, with its value in carbon transactions projected to meet 2.5 billion US dollars by 2020.

We explore what efforts are needed to sustain this unique market and where the opportunities to enhance its performance lie.

Despite frustration seen across the world from political barriers in policy development, governments and companies are opting to step up and take proactive action on climate change. One aspect of this action has included turning to the voluntary carbon markets - a functioning international market mechanism operating in areas where policy is yet to be implemented or is failing its intentions.

State and trends of the voluntary markets

The voluntary carbon markets have experienced growth despite the economic recession. This is a clear indication of the business community's interest to take action on climate change both in the absence of and as a complement to regulation on emissions. In particular, in 2012, voluntary actors contracted 101 million tonnes of carbon offsets ($MtCO_2e$) for immediate or future delivery – 4% more than in 2011.

Ninety percent of offset volumes were contracted by the private sector. The European private sector was the voluntary markets' biggest buyer by region, an interesting trend and perhaps a reflection of the education and awareness in carbon management that regulatory schemes have driven for the EU business audience. The manufacturing and energy sectors in Europe were tied as the top source of demand for offset projects. European buyers are the world's primary source of demand for projects sourced in developing countries. The United States is second in line as biggest buyer, prefering US-based projects in comparison to Europe buying from developing countries.

In the voluntary carbon markets - unlike compliance schemes - buyers are choosing to purchase credits to address a whole host of reasons related to their corporate and climate strategies. Government and businesses that wish to reduce their carbon impacts are funding projects and enabling the continued growth of voluntary markets. The voluntary markets do not work with the same forces as those that drive the compliance markets and, as such, the future state of the markets relies - and has the opportunity to focus - on strong efforts to bolster new and sustained demand for ambitious voluntary carbon management including the use of offsets. Both the public and private sector can use market mechanisms to drive emissions reductions in unregulated sectors, further driving emissions reductions beyond regulatory requirements by utilising the voluntary market. It is down to both government and industry leaders to provide leadership and steer issues such as supply-and-demand management that will see through the continuing success of the voluntary markets.

In the voluntary carbon markets buyers are choosing to purchase credits to address a whole host of reasons

Quality assurance is readily available and market demand is driving highest quality

Business buyers (quite often large multinational corporations) with stringent internal process and management controls are driving the market demand for high quality carbon credits. These "corporates" are requesting credits generated with social and environmental impact and benefit assessments that are completed to internationally recognised standards and can be traced through an independent registry. The market has matured in recent years, and buyers

appear to have a preference for credits that have been verified to internationally recognised standards to assure environmental and social integrity. Further more, corporates are requesting professional service providers that are quality assured through the ICROA Code of Best Practice or, in the United States, the Green-E-Climate consumer assurance to meet their due diligence procedures on provision of carbon management and offsetting services.

Innovation within the industry

With the projected growth in the market at a suggested figure of 2.5 billion US dollars by 2020, it is important that leaders in the voluntary markets guide its direction and continue to champion consistent standardised and rigorous approaches.

An educator to new business audiences yet to implement carbon policies

The voluntary markets industry plays a role in educating business on carbon management and broader climate change risk and impacts. This is a necessary step to engaging potential purchasers. Much of this work is driven by the carbon-offset retailers. Project developers are also starting to focus on how to engage with businesses to generate buyers and exchanges are providing a platform to facilitate sales. Given the market is quick to innovate, flexible to rectify market failures, and internationally applicable, it is also providing a framework and interest area to multinational corporate climate leaders wishing to address their supply chain impacts or incite internal carbon reduction behaviours.

Buyers in the voluntary markets are driven by such factors as consumer pressure, a desire for demonstrating "climate leadership" (Peters-Stanley, 2013), corporate social responsibility (CSR), de-risking their business operations against climate change and seeking efficiency improvements through management strategies (ICROA, 2013). A role in promoting standardised approaches to offsetting in domestic and bottom-up offset schemes

The nature of the voluntary markets is fundamentally different from that of the compliance markets. It is a showcase for how carbon offset markets function, especially in comparison to the more bureaucratic and slower compliance markets (Guigon, 2010). Gore (2013) notes, for instance, that "a number of the carbon credit innovations that were pioneered by bodies such as the Gold Standard and the Verified Carbon Standard have allowed the United Nations carbon credit system to expand beyond large, industrial project types like refrigerant destruction, large hydropower and waste heat recovery."

The market has gathered increasing interest from governments looking to set up their own carbon offset programmes and infrastructure aspects to support the development of voluntary carbon markets such as Australia's National Carbon Offset Standard (NCOS) or, more recently, Chile's Santiago Climate Exchange and Japan's JVER scheme. It appears that governments are utilising and learning from the international voluntary markets, and there is an opportunity to promote standardised approaches whilst maintaining flexibility to suit both policy makers and industry participants.

Industry action to further promote the market to external audiences

The industry associations ICROA/IETA, along with academia, are assessing the benefits that the voluntary markets are delivering to nations this year. The objective of this work is to be able to more broadly discuss the impacts the voluntary markets have delivered, including emissions reductions (and beyond) since its inception. Jobs creation, technology transfer, restoration and preservation of ecosystems, local economic improvements, reducing poverty and supporting access to clean water whilst also mitigating carbon dioxide emissions will be valued to allow the industry to demonstrate to its investors the true impact that their actions are supporting.

Beyond carbon

As already mentioned, there has been interest toward a "beyond carbon" mentality, meaning that buyers are looking for credits that bring about social benefits as well as climate change mitigation in projects selected. As such, there has been a diversifying of project types. The more traditional wind energy and fuel switching projects are still popular, but forestry, land-use, and clean cookstoves projects are becoming more widespread. Perhaps because of this win-win mentality, projects are spreading to a greater number of countries, with projects sourced in Africa becoming particularly popular. Standards have moved to reflect this preference, and that is clear from the rise in popularity for the use of social and environmental standards as a

Buyers are looking for credits that bring about social benefits as well as climate change mitigation

requirement such as the Social Carbon Standard and the Climate, Community and Biodiversity (CCB) standard when "tagged" with an international carbon verification or the Gold Standard.

Where next for the voluntary markets?

Companies already involved in the carbon market can play a supportive role to the voluntary markets by participating in and adopting best practices through industry codes of best practice such as ICROA's Code of Best Practice and promoting carbon offset inclusive carbon management plans to new audiences and potential stakeholders. While the small size of the voluntary markets may be a deterrent for some to join, it provides a significant opportunity if voluntary market industry participants and stakeholders join forces, coming together to further drive market growth, leading action on climate change that is both cost-effective and socially beneficial. The fact that the voluntary markets have continued to grow despite the recent economic downturn signals the desire of companies and individuals to take action on climate change despite regulatory inertia.

[1] Ecosystem Market Place and Bloomberg New Energy Finance, State of the Voluntary Market Report, 2013 / [2] The International Carbon Reduction and Offset Alliance is the leading voluntary markets association housed in IETA. It operates an industry code of conduct to provide quality assurance for carbon management and offset service providers. For further information see: www.icroa.org

ICROA
INTERNATIONAL CARBON REDUCTION AND OFFSET ALLIANCE

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WHEN TRADE AND CLIMATE CHANGE MEASURES COLLIDE: RECONCILING PROGRESSIVE CLIMATE CHANGE MEASURES WITH FREE TRADE AND NATIONAL SOVEREIGNTY OBLIGATIONS

The ongoing absence of a meaningful international agreement on climate change among major world economies has led to a plethora of diverse and potentially conflicting regional, national and subnational measures to address greenhouse gas (GHG) emissions ("Local Measures"). Common Local Measures include addressing GHG emissions through: cap and trade systems, carbon taxes, emission performance standards, fuel quality specifications, renewable energy programs, and measures targeted at the transportation sector (specifically, vehicles and aviation). Renewable energy programs and aviation measures have recently attracted particular attention, garnered widespread allegations of trade inconsistency, and become the subject of court and World Trade Organisation (WTO) dispute resolution proceedings.

Despite its GHG benefits, the Ontario FIT has been successfully challenged by the EU, Japan, U.S. and others

The trade-climate conflict is evident in the contrast between certain countries' conflicting positions on other countries' climate change policy and their Local Measures to address climate change. The European Union, for example, has been highly critical of Canada's UNFCCC climate change actions, yet supported a trade challenge of a Canadian (Ontario) renewable energy feed-in-tariff that supports a phase out of all coal-fired power generation in that province.

The following article: (i) considers the recent trade related disputes arising from renewable energy program and aviation Local Measures and (ii) examines new developments in the aviation sector as a potential path to resolve the recent "mid-air collisions" of climate change Local Measures and international trade obligations. It is organised as follows:

- I. Renewable Energy Local Measures and Related Trade Challenges
- II. Aviation Local Measures and Related Trade Challenges
- III. The Aviation MBM Agreement as a Precedent for Trade Consistent Climate Change Measures

I. Renewable Energy Local Measures and Related Trade Challenges

Fossil-fuelled electricity generation and heat production are among the most significant global sources of GHG emissions resulting in global climate change. A number of jurisdictions have therefore implemented programs and funding mechanisms in order to facilitate the development of low or no GHG emission renewable power generation facilities and the displacement or retirement of higher emission power generation sources. More than fifty countries (including Australia, China, Spain, Germany, France, South Africa, India, the U.S. and the U.K.) have enacted feed-in-tariff (FIT) programs to guarantee a minimum price and long-term power purchase agreements for renewable energy.

Canada, which has been widely criticised by the EU and other nations for failing to meet it's GHG reduction targets in the context of its growing oil sands related GHG emissions, also has a progressive renewable energy FIT that has been implemented by the Province of Ontario to complement its regulated phase out of all coal-fired power generation in the province. But despite its GHG benefits, the Ontario FIT has been successfully challenged by the EU, Japan, the U.S. and other countries under the WTO Agreements on the basis of its local content requirements. Similarly, the FIT was not successfully upheld on Canada's appeal to the WTO dispute settlement body as set out in its decisions on Canada-Certain Measures Affecting the Renewable Energy Generation Sector and Canada—Measures Relating to the Feed-In Tariff Program (the "Canada Decisions").

In 2009, Ontario introduced its FIT Programme, which promised renewable electricity generators a set price for elec-

tricity delivered into the provincial electricity system, pursuant to 20 or 40-year FIT Contracts. Ontario-based projects that complied with Minimum Required Domestic Content Level requirements ("Domestic Content requirements") and committed to producing electricity from wind, solar PV, renewable biomass, biogas, landfill gas, or waterpower, were eligible to participate in the Programme. These requirements stipulated that certain Ontario-sourced goods—such as renewable energy generation equipment—had to be used by FIT suppliers that used solar PV technology and by FIT generators that used wind power technology.

In 2010, Japan requested WTO consultations with Canada over what it considered to be the discriminatory and protectionist character of these Domestic Content requirements, and in 2011, the EU requested consultations in respect of the same. The disputes were ultimately referred to a WTO Panel, where the legality of the FIT Domestic Content requirements was challenged under the Trade-Related Investment Measures ("TRIMs") Agreement, the Subsidies and Countervailing Measures ("SCM") Agreement, and the GATT 1994—all of which include provisions that prohibit the use of local content requirements and discriminatory conduct.

In December 2012, the Panel released conjoint decisions that responded to both Japan and the EU's claims (collectively, "the complainants"). The Panel found that the FIT Programme and contracts, to the extent that they imposed Domestic Content requirements on generators, constituted prohibited trade-related investment measures within the meaning of the TRIMs Agreement, and consequentially, were inconsistent with Canada's "national treatment obligation" under Art. III:4 of GATT. The Panel further found that Canada could not rely on Art. III.8(a) of the GATT—a provision that permits member-states to derogate from the national treatment obligation where it can be shown that the measure in question governs the government's procurement of "products purchased for governmental purposes and not with a view to commercial resale". The Panel found Ontario to be ineligible for this exception.

The Panel also considered whether the Domestic Content requirements of the FIT Programme and contracts constituted a prohibited subsidy contrary to the terms of the SCM Agreement. In order to be classified as a subsidy within the meaning of this Agreement, a measure must be shown to: (i) be a government measure or policy that provides a financial contribution to the recipient; (ii) confer a benefit on the recipient; and (iii) meet the requirements of specificity. While the Panel found that the challenged measures could be characterised as a "financial contribution" in the form of "government purchases of goods", it held that the complainants had failed to establish that this financial contribution conferred a "benefit" and therefore that the measures amounted to a prohibited subsidy. In light of these determinations, the Panel made the recommendation that Ontario revise the Domestic Content requirements of its FIT Programme to bring them into conformity with Canada's obligations under the TRIMs Agreement and GATT.

The parties appealed the Panel's ruling to the WTO Appellate Body ("AB"), which released its decision in May of 2013. The AB's decision substantially upheld the Panel's ruling, although it overruled the Panel's findings on the subsidy and "conferred benefit" analysis, but did not rule on whether the FIT constituted a prohibited subsidy, as it did not have sufficient evidence on the record. In the end, the AB reaffirmed that Canada was obliged to reform its Domestic Content requirements so as to be consistent with the TRIMs Agreement and GATT.

Notably, in coming to this conclusion, the original Panel was not presented with an argument that the FIT should fall within the environmental exceptions set out in GATT Article XX, which may have put the trade-climate issue squarely before the Panel. Nonetheless, the Panel explicitly attempted to side-step the trade-climate conflict and distance itself from the broader renewable energy Local Measures policy issues at stake, noting:

In coming to this conclusion, we express no opinion about the legitimacy of the Government of Ontario's objective of promoting the use of renewable energy in the production of electricity through the FIT Programme. Our conclusion […] must be understood only as a judgement about the extent to which Canada is entitled to rely upon Article III:8(a) of the GATT 1994 to maintain a measure that is alleged to discriminate against imported products […].

However, the net effect of the Panel ruling contributed to Ontario cancelling its FIT Programme for large (greater than 10 MW) renewable energy generators. At best, it is questionable whether the WTO Panel was able to side step the trade-climate conflict that appears to be a consequence of its decision. The trade-climate conflict has also reared its head in the aviation sector.

II. Aviation Local Measures and Related Trade Challenges

In 2009 the EU Emissions Trading System (EU ETS) was amended to include an Aviation Directive ("the Directive") that applied not only to EU aircraft operators, but also to foreign-based air carriers that take off or land within EU territory. Pursuant to the Directive, aircraft operators are issued emission allowances and operators whose emissions are in excess of their permitted allowances are required to purchase allowances from other market participants. Importantly, the impact of the Directive required aircraft operators taking off or landing at an EU airport to hold and surrender emissions allowances for each tonne of carbon dioxide generated during the flight—even if only a fraction of the flight occurred within EU airspace.

In 2009, a number of UN member states and other entities acting through the Air Transport Association of America challenged, and sought to have the Directive quashed, in the Court of Justice of the European Union ("CJEU"). In the CJEU's decision in Case C-366/10 ("the Aviation decision"), the CJEU considered whether the Directive was: (i) contrary to the terms of the Convention on International Civil Aviation (the Chicago Convention); (ii) beyond the jurisdiction of the EU in light of the existence of the Kyoto Protocol; (iii) in violation of the Open Skies Agreement, an Agreement to which both the EU and US are parties, by effectually imposing a tax on all aircraft operators; and (iv) contrary to customary international law.

The Court found that: (i) the Chicago Convention could not appropriately be invoked in the case before it because, notwithstanding that all of the members of the EU had signed and ratified the Convention, the EU itself was not a party to the Convention ; (ii) the Kyoto Protocol could not be considered "unconditional and sufficiently precise so as to confer on individuals the right to rely on it in legal proceedings in order to contest the validity of the Directive". (iii) the Directive was not contrary to the Open Skies Agreement as the EU ETS could not be construed as imposing a tax or fee on airlines, because the actual costs that it imposed were not fixed but rather dependent on market forces; and (iv) the EU's decision to impose non-discriminatory conditions on all aircraft operators operating within European territory was not contrary to customary international law or a "manifest error" regarding the EU's competence, which warranted overruling.

The CJEU Decision highlighted the breadth of its discretion to consider broader climate change policy in contrast to the more narrow scope of the WTO analysis and may result in parties that are faced with a trade-climate conflict carefully choosing their intended forum for dispute resolution accordingly. However, the greatest impact of the CJEU Decision was to insight sovereign interests to take local action in attempt to negate the Directive. Following the release of the CJEU's Decision, opposition mounted and in 2011, nearly 30 countries adopted a joint declaration condemning the Directive as discriminatory and a violation of international law. The US House of Representatives passed a bill which banned US air carriers from complying with the Directive; China has suspended an order from Airbus in the amount of USD 4 billion, in what was widely regarded to be a retaliatory dig; and India threatened to launch a challenge with the WTO on the grounds that the EU scheme constitutes an "illegal unilateral trade measure". The EU eventually agreed to temporarily suspend application of the Directive to flights outside of Europe pending developments on a global approach to airline emissions through the UN related International Civil Aviation Organization (ICAO) in 2013.

III. The Aviation MBM Agreement as a Precedent for Trade Consistent Climate Change Measures

On Friday, October 4, 2013, the ICAO reached an historic agreement among its nearly 200 member states to pursue common, market-based greenhouse gas (GHG) emission reduction mechanisms for the global air transportation sector (the MBM Agreement). The MBM Agreement is being touted as a successful instance of international co-operation to address climate change by ICAO Council President Roberto Kobeh González who stated,"… our States have shown that significant boundaries can be surpassed when we agree to recognise and accommodate our varying circumstances while progressing together towards common goals."

The framework agreement authorises the agency to develop GHG reducing market-based measures (MBM) over the next three years. The details would then be ratified at the next general assembly in 2016 for implementation by 2020. Among other things, it may lead to the sector taxing airlines for their greenhouse gas emissions. Countries rejected a European Union proposal that allows the EU to apply its own cap-and-trade emissions scheme to foreign airlines until the global program takes

The MBM Agreement may signal an end to the 'mid-air collisions between climate policy and trade

effect. On October 16, 2013, the EU announced that it intends to accept the ICAO MBM Agreement and adjust the EU ETS to apply to flights only for the portion of the flight segment that occurs in Europe. The adjustment would apply starting in 2014 and until the planned MBM applies to international flights starting in 2020. Flights from developing countries that emit less than 1% of global aviation emissions would benefit from a full exemption. While this final plan awaits approval by the European Council and Parliament, its significance cannot be underestimated. The MBM Agreement constitutes the first instance of meaningful progress on a trade consistent, worldwide agreement on climate change, applicable to a small but important segment of the global economy.

In conclusion

If the MBM Agreement is successful, it may signal an end to the mid-air collisions between progressive climate policy and international trade obligations that the global market place has experienced over the last several years, and chart a path forward for industry sector-based multilateral action to address climate change in a manner that is respectful of international trade obligations – as well as local circumstances and national sovereignty rights.

[1] The Author would like to thank Lauren Hauser of Norton Rose Fulbright for her talented and diligent research and writing assistance. / [2] Daniel Peat, at p 43 and 47: Other countries that have adopted FIT programmes include 18 EU member-states, Australia, China, India, South Africa, Switzerland, and 37 US states. / [3] WT/DS412/AB/R at 4.17 ("AB Decision"). / [4] AB Decision, at 4.17. / [5] AB Decision, at 4.21: Notably, the Minimum Required Domestic Content Levels do not apply to qualifying projects using any of the other renewable energy sources covered by the FIT Programme. / [6] AB Decision, at 4.22. / [7] Panel Decision, at 7.111. / [8] Panel Decision, at 7.167. / [9] Panel Decision, at 7.116. / [10] Panel Decision, at 7.152. The Panel reasoned that the province's FIT Programme did entail government procurement of a product—mainly, electricity; the Domestic Content requirements did impact whether the province would procure that product; and this procurement was undertaken with a view to commercial resale. / [11] Peat, at p 55-56. / [12] Panel Decision, at 7.222. / [13] The US however recently challenged Chinese incentives for solar panel manufacturers as a subsidy and imposed countervailing measures in the form of a price adder to such panels. / [14] AB Decision, p. 142. / [15] Panel Decision, at 7.153. / [16] Kati Kulovesi, at 543. / [17] Sanja Bogojevic, at p 3. / [18] C-366/10, at para 4 ("CJEU"). / [19] CJEU, at para 71. / [20] CJEU, at para 77. / [21] CJEU, at para 142. / [22] CJEU, at para 110. / [23] Kulovesi, at p 536. / [24] Kulovesi, at p 536.

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THE TOOLS

FINANCING LOW CARBON DEVELOPMENT

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FINANCING THE TRANSFORMATION: MOBILIZING INVESTMENT IN CLIMATE ACTION

"Climate finance" is increasing in political importance as governments grapple with the challenge of financing the transition to a low-carbon, climate-resilient economy. Yet the term is deceptively simple – in reality, climate finance is shorthand for a complex set of financial instruments and policy interventions ranging across many sectors and types of investments. Climate finance encompasses clean infrastructure finance, climate-resilient development assistance, sustainable agricultural supply chains, and so on. The variety of financing tools and policies needed to enable mitigation and adaptation activities is vast and the range of actors that supply the necessary financing is diverse.

Yet for all its inherent complexity, climate finance is not a mystery. A great deal of analytical work has been done on the barriers to catalyzing large-scale private flows into low-carbon infrastructure in developing countries. We understand the range of tools needed to address those barriers, and we already have institutions through which to deploy those tools. We also know that the most strenuous efforts to "push" financial resources into countries will not be effective without complementary efforts by recipient countries to "pull" investment in through the right combination of regulations and incentives. This article highlights some of the lessons learned about the emerging world of climate finance and what it takes to make it flow.

The challenge of "mobilizing" investment

In the context of climate finance commitments under the UNFCCC, we are collectively in the process of pivoting from the "fast start finance" period (2010-12) to focus on the goal of collectively mobilizing USD100 billion in climate finance per year by 2020, from a wide variety of public and private sources. In the course of providing more than USD30 billion in public resources during the fast start period, donor countries had the chance to test new delivery mechanisms, financing approaches, and forms of cooperation.

Whereas fast start finance was about "providing" public finance, the $100 billion goal refers to "mobilizing both public and private resources." This shift has reignited debates within the UNFCCC about the relative importance of public and private resources. However, this is ultimately a practical rather than political question. The resources managed by private investors dwarf those available for public expenditure on climate assistance. In 2011, Official Development Assistance from OECD countries amounted to USD134 billion while assets under management of conventional global funds, including pension funds, mutual funds, and insurance companies, amounted to USD80 trillion.

In principle, the global capital markets have the size and depth to step up to the climate finance investment challenge. Also, a large share of climate-friendly infrastructure projects (particularly for mitigation) can deliver a financial return and therefore lend themselves to private investment. Low-carbon energy infrastructure, for example, is a good match for conventional global funds looking for long-term investments to balance their

long-term liabilities to pensioners, insurance policy holders, and other beneficiaries. Finally, more efficient leveraging of private investment where possible can enable us to use more public resources in areas and sectors where the private sector is less likely to invest on its own, particularly in areas like adaptation for the most vulnerable and least developed.

At the same time, maintaining a strong core of public climate finance is also essential. The most important and persuasive argument for public finance is not that it is owed, but that it is needed: building financing strategies around private investment will be difficult in certain sectors – in particular for adaptation – and in certain countries – including many least developed countries. We recognize that the public sector needs

to play a more comprehensive role in those areas. And for many sectors in which private investment can be leveraged, we still need a lever in the form of public finance. However, the fiscal reality of most developed countries is difficult. This is partly why conversations about climate finance must go beyond the subject of solely how to raise more public resources. We also need to focus on how to use the public resources at our disposal to leverage the maximum total amount of climate finance.

Fortunately, recent climate finance conversations within the UNFCCC have begun to move away from ideological debates and have focused on public and private finance as two pieces of an integrated climate finance investment puzzle. This is a welcome development, because public and private finance instruments are often blended together in major infrastructure finance – whether you're talking about mitigation (e.g. hydropower projects) or adaptation (e.g. coastal real estate development).

Barriers to scaled-up investment

The challenge of mobilizing private investment in climate friendly infrastructure in emerging markets is inherently complex, but the barriers and solutions are relatively well understood. A review of existing studies by think tanks, private investors, foundations, and public institutions shows strong convergence on the key areas where public resources and interventions can be called upon to address two key barriers to private investment in green infrastructure in developing countries. The first barrier is the difference in financing costs, often further compounded by fossil fuel subsidies, between low-carbon and high-carbon technologies and infrastructure. The second barrier is the bundle of risk factors that limit foreign direct investment in developing countries. These include country risks applicable to all investment types (e.g. weak investment climate, uncertain property rights, currency risk, political risk) as well as risks specific to climate investments (e.g. untested technologies and systems, instability of regulatory incentives for low-carbon investment).

The net result of these barriers is that market-based equity and debt financing for low-carbon investments is either too costly or not available at all in many developing countries. In order to mobilize climate finance at the scale required, the risk/return calculation for low-carbon investments in developing countries must come to resemble the risk-adjusted return of other, business-as-usual options that investors currently prefer.

Tools to address the barriers

There are many ways to categorize the interventions needed to overcome the two barriers described above. The first step necessarily lies with the host country. Mitigation and adaptation plans should be country-driven, and it is up to each country to devise strategies for attracting the appropriate combination of financial resources – both public and private – to implement its plans. These enabling policies and incentives can address both climate-specific factors, such as technology risk and policy risk, as well as non-climate related factors, such as currency risk, legal risks, and political risks.

Donor countries can then play an important supporting role by providing four key tools:

- FIRST, we can help to strengthen domestic policy frameworks and general enabling conditions through targeted technical assistance. For clean energy, this may include implementing regulatory measures such as feed-in tariffs and energy efficiency regulations, and surveying energy resources and grid infrastructure needs. For adaptation, this may include integrating adaptation into national planning and development policies, including land use reform.
- SECOND, we can reduce the risks of investments through surgical application of risk mitigation tools. Even with the right regulatory incentives in place, it can be difficult to attract both foreign and domestic investors to emerging markets with new technologies. Donor countries, working through their development finance institutions (DFIs) and other public finance vehicles, can offer risk reduction products that are unavailable or otherwise too expensive to access domestically. These include political risk insurance, regulatory risk insurance, first loss equity, partial risk guarantees, project preparation assistance, and currency hedging facilities.

- THIRD, we can increase the supply of and avenues for the kind of low-cost, long-tenor lending that is needed to finance infrastructure projects. Clean energy and energy efficiency projects are sensitive to financing costs, especially because

of their high upfront capital requirements. Working with relatively new technologies in developing markets where interest rates are high, project developers often struggle to access the large amount of low-cost financing they require. Donor countries, benefitting from their low cost of borrowing, can help channel low-cost, long-tenor debt not otherwise available on a commercial basis.

- FOURTH, where the above is not sufficient, we can provide concessional financing to address the residual viability gap between low-carbon and high-carbon technologies. This can be delivered in many forms including grants and concessional loans and tax credits, as well as indirectly through the elimination of fossil fuel subsidies.

Delivering the tools

Of course, this is not just a theory. We already have the means to deliver these tools, and are already in the process of scaling them up. The multilateral development banks (MDBs) and bilateral development finance institutions (DFIs) – like the U.S. Overseas Private Investment Corporation (OPIC) – are expanding low-cost, long-tenor lending and thereby attracting significant private sector co-financing. According to a recent survey by Climate Policy Initiative (CPI), DFIs alone have already scaled up climate finance in developing countries to approximately USD12 billion in 2012 (USD10 billion for mitigation, USD2 billion for adaptation). The MDBs and DFIs are also expanding their toolkit of risk mitigation instruments. Meanwhile, the multilateral climate funds – e.g. the Climate Investment Funds, Global Environment Facility, and eventually, the Green Climate Fund – are gradually increasing the availability of incremental cost financing. Finally, bilateral aid agencies like USAID are delivering significant technical assistance and capacity-building support to strengthen enabling environments for low-carbon investment in developing countries.

There is also a growing recognition that more coordination is needed, and that the division of labor among financing channels needs to be refined. In April 2013, the United States hosted a meeting of climate ministers and senior finance officials from fourteen donor countries, who agreed to launch new work to coordinate and strengthen the climate finance activities of public finance institutions, including development finance institutions, multilateral development banks, key multilateral climate change funds, and export credit agencies. For example, the senior leadership of 15 DFIs and development banks from developed countries met in September 2013 for their first ever full conference on climate finance and agreed to enhance their collective efforts to support green investments in developing countries. A few weeks later, export credit agencies from developed countries convened in Copenhagen to consider how they can play an enhanced role in climate finance, and an analogous coordination process is now underway in the MDBs. Getting the direct buy-in of these institutions at the most senior levels is critical to implementing the political commitments climate ministers make on climate finance in the UNFCCC context.

Going forward

As we begin to better understand the contours of the climate finance challenge, some of our key tasks going forward are becoming clearer.

First, we don't need to treat climate finance as a mysterious equation waiting to be solved. We know what tools need to be deployed to catalyze climate action, and we have a powerful set of existing public finance institutions – including bilateral aid agencies, MDBs, DFIs, ECAs, and the Climate Investment Funds – through which we can deploy those tools.

Second, we have reached an important phase in the development of the Green Climate Fund. Expectations are high on the part of many stakeholders – donors, recipient countries, and the private sector alike – that this fund will be truly innovative and live up to the promise of promoting a real "paradigm shift" in climate finance. Many key design decisions will be made in 2014 that will help determine the fund's success in attracting donor resources.

Third, if we want to be smart about using limited public resources to support low-carbon alternatives, it makes sense to also consider phasing out public financing for high-carbon infrastructure. Otherwise, the two risk cancelling each other out from an emissions impact perspective. In June 2013, President Obama announced an end to U.S. government support for public financing of new coal power plants overseas, except in very limited circumstances, and the Nordic countries, World Bank, and European Investment Bank have since done the same. Similar progress is needed in phasing out fossil fuel subsidies.

Finally, we need to improve the way the public sector interfaces with the private sector to develop new approaches to climate finance. The last few years have seen many useful public-private summits, roundtables, and initiatives on this subject, and several financial institutions have made specific proposals – ranging from climate bonds to new risk mitigation instruments – to catalyze private flows at scale into the kinds of investments that will be needed. Yet

there is a sense that these conversations rarely graduate from talk to action, and a kind of "dialogue fatigue" is setting in. The United States is now working with a number of other countries, multilateral institutions, and private investors to explore the creation of an action-oriented platform to design and pilot the next generation of climate finance instruments.

Conclusion

The last year has been an important one for climate finance. We completed the USD30 billion fast start finance commitment, finishing a three-year period in which we dramatically expanded the range of partnerships with developing countries to design, test, and deploy the appropriate set of financial tools and enabling conditions needed to scale up climate action. We also laid the groundwork for an even more ambitious and wide-reaching set of efforts aimed at catalyzing low-carbon investment in developing countries. Putting together the climate finance jigsaw is an ongoing effort that will require flexibility and political will on the part of all countries, as well as the creative engagement of the private sector and civil society.

[1] OECD DAC members' net ODA. See www.oecd.org/dac/stats/tab01e.xls. / [2] TheCityUK's Fund Management November 2012. See: www.thecityuk.com/assets/Uploads/Fund-Management-2012.pdf. / [3] For a summary of this ministerial meeting, see www.state.gov/e/oes/rls/remarks/2013/207420.htm.

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Climate Focus North America

ADDING TO THE REDD FINANCE TOOLBOX

There is little doubt that without significant reductions in emissions from deforestation and forest degradation (REDD), we will be unsuccessful in our goal to limit global warming to just 2°C. This paper argues that to achieve REDD we need to adopt a flexible and comprehensive approach towards REDD finance. We should draw from successful examples outside of the forest sector that have achieved significant results in the face of complex challenges. Ultimately, we should make full use of the range of options to mobilize private sector finance and expand our toolbox of policies and incentives to reduce emissions from deforestation and forest degradation.

The dichotomy of REDD finance discussions

Asking what REDD costs is an (almost) meaningless question. The diverse range of approaches that will be needed to address deforestation and forest degradation, as well as the diversity of countries in which REDD will be implemented, will distribute costs (and benefits) in highly unpredictable ways. This question, however, has polarised discussions on REDD finance into an either/or mind-set of "payments for performance" versus "structural transformation", often epitomized in the carbon markets versus fund debate.

On the one hand, studies that have looked into the costs of REDD (and have subsequently argued that it can be achieved at relatively low costs) have typically used an opportunity cost model. Under this model, costs are calculated as the foregone revenue of not converting forestland to another, more profitable activity, e.g. palm oil in Indonesia, soy in Brazil, or coffee in Ghana. Such models vary in their complexity and can assess a range of factors, including changing commodity prices, increased land scarcity and regional variations. All these models, however, ultimately assume that if the total costs are balanced by an opposing benefit (e.g. a carbon payment) then deforestation will be halted.

On the other side of the debate, another set of studies have focussed on addressing the major structural problems that underlie deforestation and forest degradation, including unsustainable land use planning, insecure land-tenure and poor forest governance. These studies do not propose aggregate financing needs for REDD+, instead, they outline the types of activities that should be funded under a REDD framework to achieve structural change within a country (e.g. land tenure reform, governance improvements).

The toolbox of REDD finance

With very few exceptions both of these approaches rarely explore the types of mechanism that could be employed to deliver REDD+ finance. Typically, it is assumed that either some form of carbon price is needed to counter opportunity costs, or grant-based donor driven models will be needed to address structural transformation. More broadly (and more problematically) within the current implementation of REDD finance, a similarly narrow focus prevails on how finance should be delivered that follows these same modalities.

We know, however, that REDD finance can follow a range of predefined modalities. Using a simple typology, these modalities can be divided into four key groups: direct and indirect investments, and market-linked and non-market finance (see Figure 1). The ability to scale up finance depends largely on the source of finance broken down across these groups. Furthermore, the way in which finance can be delivered will change based on the source of funding.

A brief aside on behavioral psychology

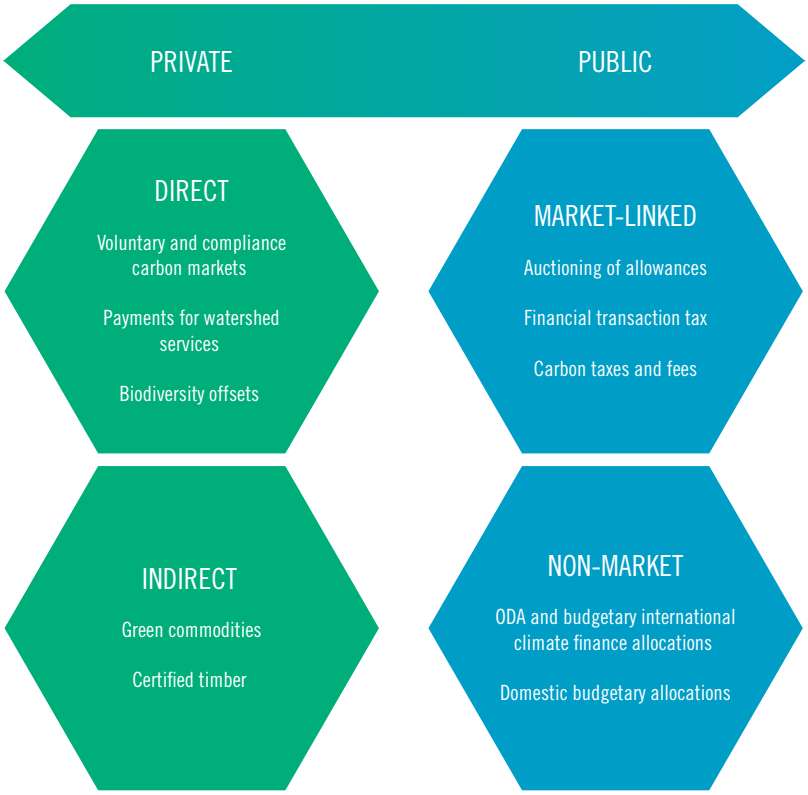
behavioural psychology shows us that changes in collective action - such as those needed to address global commons - require both individual and collective incentives. In addition, behavioural change can be driven by both hard (or automatic) conditions (e.g.

reaching carrying capacity within a population, or being fined for speeding), or through soft (or reasoned) approaches (e.g. a no smoking campaign, or opting to become vegetarian). Public dilemmas can be further categorised into seven strategies for behavior change, namely:

1. Provision of physical alternatives;
2. Regulation and enforcement;
3. Financial or economic stimulation;
4. Provision of information and education,
5. Social modeling and support;
6. Organizational change;
7. Changing values and moral norms;

Typically international interventions to address global commons, such as REDD, fall under the first three strategies outlined here (so called hard interventions). Soft interventions (the latter four strategies) are typically overlooked in international policy design.

FIGURE 1: PRIVATE AND PUBLIC SECTOR SOURCES OF REDD FINANCE (ADAPTED FROM PARKER, CRANFORD ET AL. 2012)



Looking for tools outside the box

The remainder of this paper looks at initiatives from outside of the forest and land use sector to identify potential pathways to scaling up finance for REDD. These interventions use mechanisms that diverge from the typical "fund versus market" dichotomy and draw on some fundamental lessons from behavioural psychology.

Germany's feed in tariff: achieving scale through local ownership

In Germany, the federal government has successfully scaled up renewable energy production from 6.3% of the national total in 2000 to over 25% in 2013. This remarkable achievement has been made possible in large part due to the government's implementation of renewable feed in tariffs (FITs). What is more remarkable perhaps though is that, of Germany's installed renewable energy, over a half is owned by citizens and farmers, not utility companies . This represents a clean energy investment totaling $100 billion in Germany. German consumers pay among some of the highest electricity prices in Europe and energy independence has played a large role in the shift from state or utility provided electricity to self-installed energy generation. In addition, individual and community ownership of energy generation has proved a powerful driver of behavioural change.

OPower: using social comparison to change behavior

Founded in 2007, OPower is a US company that sends Home Energy Reports to residential utility customers comparing their electricity use to that of their neighbours. The company's business model is premised on the understanding that people are more likely to change their behaviour when they receive feedback on their performance, especially when it's compared to that of their peers. Each month OPower customers receive a home energy report, detailing their progress, as well as recommendations on how to further improve their energy consumption. Using this model OPower has reduced energy consumption by on average 2% across its customers - a reduction equivalent to a 10-20% increase in energy prices. Considering a large percentage of OPower's reports probably go unread, the impact on energy consumption is likely even more significant.

Fairtrade: tapping consumer preference to build a 10bn industry

The Fairtrade label is a USD $6 billion business with operations in over 70 countries reaching more than 1.3 mil-

During this early phase of REDD implementation we should be creative in how REDD finance is delivered

lion farmers worldwide. Fairtrade operates by paying a premium to producers, which in turn is passed on to consumers who are willing to pay extra for the knowledge that they have contributed to improved living and working standards for farmers. While Fairtrade products represent only a small share of the world market, international sales in Fairtade produce is growing at around 20% per year. The benefits of Fairtrade certification to farmers, while being mostly financial in the short run, build the capacity of farmers, fueling sustainable development in the long run.

Scaling up REDD Finance

Public finance for REDD is scarce and is in large part being generated through domestic public sources. If we are to achieve meaningful reductions in deforestation and forest degradation, this limited finance will need to leverage significant sources of private sector finance.

In addition, we need to explore a range of options that exploit and change social and individual norms, while remaining rooted in activities that address the underlying structural problems that drive deforestation and forest degradation. During this early phase of REDD implementation we should be creative in how REDD finance is delivered.

Some initiatives have emerged in recent years that we can build upon. The Consumer Goods Forum's commitment to zero deforestation by 2020 and Unilever's 'Sustainable Living Plan' are already changing the way in which producers supply deforestation-risk commodities; Proforest's Smallholders Acceleration and REDD+ Programme (SHARP) and Solidaridad's Farmer Support Program (FSP) aim to provide incentives to farmers to change to more sustainable production practices; and a range of commodity roundtables and the Forest Footprint Disclosure project are trying to incorporate deforestation emissions into supply chain decision making.

In the coming years, we need to sharpen our current tools and look outside of the forest sector for new instruments that can help us to achieve REDD at scale. What would a feed in tariff for forests look like? How can we harness social comparison to incentivise behavioural change? How do we tap into consumer preference to change the way in which farmers operate?

Alongside our current efforts to address deforestation and forest degradation we should aim to answer some of these questions and add to our REDD toolbox.

[1] In this paper REDD refers to the outcome of reduced emissions from deforestation and forest degradation rather than the specific mechanism being negotiated under the UNFCCC that was initiated under the Bali Action Plan. / [2] Streck, C. and C. Parker (2012). Financing REDD+. Implementing REDD+. A. Angelsen. / [3] Stern, N. (2006). Stern Review: The Economics of Climate Change. Cambridge, UK. Bishop, J. (2009). The Financial Costs of REDD: Evidence from Brazil and Indonesia, IUCN. Kindermann, G., M. Obersteiner, et al. (2008). "Global cost estimates of reducing carbon emissions through avoided deforestation." Proceedings of the National Academy of Sciences 105(30): 10302-10307. Pagiola, S. and B. Bosquet (2009). "Estimating the costs of REDD at the country level." / [4] Karsenty, A. (2012). Financing options to support REDD+ activities, CIRAD. / [5] Karsenty, A. and S. Ongolo (2012). "Can "fragile states" decide to reduce their deforestation? The inappropriate use of the theory of incentives with respect to the REDD mechanism." Forest Policy and Economics 18: 38-45. / [6] Parker, C., M. Cranford, et al. (2012). The Little Biodiversity Finance Book. Oxford, Global Canopy Programme. / [7] Schmuck, P. and C. Vlek (2003). "Psychologists can do much to support sustainable development." European Psychologist 8(2): 66. / [8] With the exception perhaps of organizational change and provision of education as discussed under readiness strategies / [9] www.bdew.de/internet.nsf/id/20120726-pi-erneuerbare-energien-liefern-mehr-als-ein-viertel-des-stroms-de/$file/Strom_Erneuerbaren_Energien_1_Halbjahr_2012.pd / [10] www.treehugger.com/renewable-energy/over-half-germany-renewable-energy-owned-citizens-not-utility-companies.html / [11] www.treehugger.com/environmental-policy/town-goes-grid-achieves-energy-independence.htm / [12] See http://opower.com/what-is-opower/reports / [13] Allcott, H. (2011). "Social norms and energy conservation." Journal of Public Economics 95(9): 1082-1095. / [14] www.fairtrade.net/fileadmin/user_upload/content/2009/resources/2012-13_AnnualReport_FairtradeIntl_web.pdf / [15] Raynolds, L. T., D. Murray, et al. (2004). "Fair trade coffee: building producer capacity via global networks." Journal of International Development 16(8): 1109-1121. / [16] Parker, C., J. Brown, et al. (2009). The Little Climate Finance Book. Oxford, Global Canopy Programme. / [17] Parker, C., M. Cranford, et al. (2012). The Little Biodiversity Finance Book. Oxford, Global Canopy Programme. / [18] www.sharppartnership.org / [19] http://solidaridadnetwork.org/soy

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Charlie Parker is Executive Director of Climate Focus North America. He has an extensive career in land use policy and is an MSc graduate in Environmental Economics and Policy from Imperial College, London. Following on from his studies Charlie worked at the United Nations Framework Convention on Climate Change before joining the Global Canopy Programme, a UK based think tank that develops policy and science-based research for tropical forest conservation. During his time at the GCP, Charlie worked on land use policy, including publications such as the Little REDD Book and Little Climate Finance Book, and he managed and developed the REDDdesk – a collaborative platform on deforestation in developing countries. Charlie first graduated from the University of Manchester with an MSc in Physics and Astrophysics. During his early career, he worked as a management consultant in Europe and Australia. Upon returning to the UK, Charlie formed his own consultancy and worked in London for two years prior to restarting his studies.

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NAMAS: ALIGNING DEVELOPMENT IMPERATIVES WITH PRIVATE SECTOR INTERESTS

If the world is to limit the temperature increase to 2°C, it is acknowledged that the upward trend in greenhouse gas (GHG) emissions in developing countries must be curbed. Until recently the Clean Development Mechanism (CDM) has been the primary vehicle to secure financing, advance mitigation projects and place concrete value on actions that reduce GHG emissions in developing countries. As the CDM faces challenges in some markets, a new vehicle is increasingly becoming available and taking centre stage. Nationally Appropriate Mitigation Actions (NAMAs) are seen as a viable instrument for developing nations to proactively address climate change in a fashion that harnesses development objectives and enables a low-emissions development pathway.

The concept of NAMAs was originally introduced at the 2007 Bali Conference of the Parties (COP). In its most broad form, a NAMA is a set of policies or programmes designed and implemented by developing countries, which result in emission reductions that are voluntarily communicated to the international community through the United Nations Framework Convention on Climate Change (UNFCCC). By engaging and communicating the implementation and results of NAMAs, developing countries gain recognition for efforts made domestically and may secure additional international support for their actions.

A NAMA is in principle designed to jointly address the seemingly incongruent objectives of emissions reduction and economic development by addressing emissions from an economy-wide or a sector-based perspective. While NAMAs are thought of at the outset to be public sector led, there is an expectation that the bulk of emission reductions resulting from NAMAs will come from private sector investments and emission reduction projects. NAMAs therefore offer the potential to foster a long-term economic transformative process by mobilising the public and private sectors in addressing climate change and related sustainability objectives.

For those with experience in the carbon and development fields, the broadly defined promise of NAMAs must be tempered with the reality of the efforts at each and every stage of their development. These efforts begin with the initial study, the selection and design of actions, the establishment of an operating framework, capacity building, piloting, financing and eventually implementation and tracking of metrics. Each and every one of the stages represent opportunities to foster private sector actions and investments, though this remains an important challenge for NAMA developers as the incentives and returns expectations for even the most forward thinking private sector actors are difficult to grasp.

Developing NAMAs in line with development plans

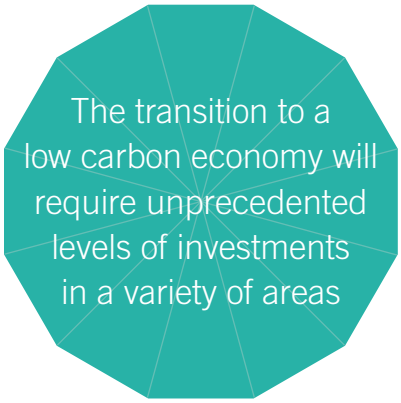
While the CDM continues and remains a viable mechanism for parts of the developing world, NAMAs represent an opportunity to address in a more comprehensive manner an important segment of the world economy where emissions and economies are growing in concert. Recognising the public sector origins of NAMAs within countries, a parallel or lesson from the CDM experience may be applied, namely that it is imperative to secure the early engagement of relevant planning, finance, transport, energy and other line ministries in sector wide mitigation actions.

NAMAs are meant to generate absolute emission reductions, not reductions to compensate emissions elsewhere on the globe

In fact, therein lies an important differentiating element of NAMAs. NAMAs are meant to generate absolute emission reductions, not reductions to be used to compensate emissions elsewhere on the globe. In contrast to CDM stand-alone projects, NAMAs are broad-based mitigation actions that are assumed to become embedded in the policy and economic matrix of a nation and as such be supported through domestic funds and/or through international support in the form of financing, technology transfer or capacity building.

There are questions that remain about the possibility of certain NAMAs to generate credits that could be sold in the global carbon market by reducing emissions below an agreed crediting baseline. However, it is expected that the vast majority of NAMAs will not be generating credits, so the precise articulation with a global market or even a regional one, is an open question.

That said, NAMAs are moving forward and, given their design, they are meant to facilitate comprehensive and sustainable GHG-abatement strategies for sectors and countries. Early experiences show that a NAMA design and development is strengthened when it emerges from, and are congruent with existing national and sector level planning processes.



As examples, both Kenya and Indonesia are envisaging NAMAs that are in-line, and even extensions of their respective national climate change action plans and established institutions. Mexico is going a step further and setting up a separate and distinct NAMA office to coordinate its emission reduction efforts within its broader economic development and industrial policy objectives.
These examples reflect the importance of anchoring NAMAs in broader climate change action plans and development strategies to garner greater political support at an early stage and to provide greater policy and regulatory certainty to stakeholders, including the business community.

NAMAs may unveil new business opportunities

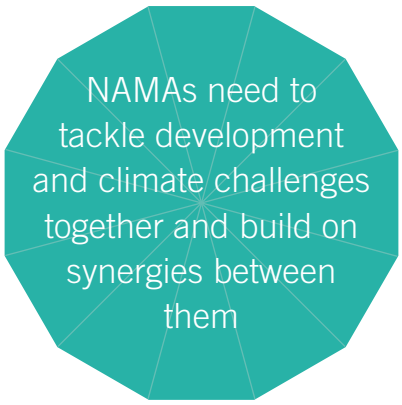
As NAMAs are gradually migrating from policy papers and sundry negotiating texts into actions, it has become clear that the transition to a low carbon economy will require unprecedented levels of investments in a variety of areas, from the planning, design and capacity building activities to the policy, financing and technology stages.

On the low carbon technology front, a recent study conducted by Accenture has estimated that this transition may require as much as 2% of global Gross Domestic Product (GDP). While estimates vary significantly, experts suggest that annual investments in the order of USD 300 billion by 2020 are needed to mitigate GHGs in developing countries to limit global warming to 2°C. Yet at the present time, there is acknowledgement that investments of that scale are lacking to even begin this transition.
A reality of the current economic environment is that public finances have been tightening in developed and developing countries, a reality which has begun to be reflected in funding and investment available for this transition from public and multilateral sources. This context often results in calls for increasing the levels of funding from private sources.

In fact, the transformative changes required to enable the low-emissions development pathways to take place represent near term opportunities for the private sector. The operating assumption of this consideration is that there is room for technical, process and financial innovation in transitioning towards a low-emissions development model. From that perspective, NAMAs have the potential to unveil new markets for various actors in the private sector. That said, for private investors to harness these new opportunities, certain basic conditions as well as critical success factors need to be in place in order for there to be a more compelling case to step up to the challenge.

In principle, NAMAs could strengthen the provision of several of these conditions and in fact become a catalyst that improves the investment environment and garners private sector support and financing. Much capital is already flowing to developing countries, albeit more to some than others; NAMAs present the potential to harness and redirect capital toward low carbon development. To do so, NAMAs should aim to clarify the policy, legal and regulatory context to ease the transaction and project burden, to simplify the process of engaging stakeholders, and in sum reduce risks for investors and participants in low-carbon markets. NAMAs can also include de-risking instruments that help overcome barriers and offer financing for pilot projects to facilitate the engagement of early stage private sector actors.

Private sector participation is required to achieve lasting and sustainable results, as business will be on the front line in implementing projects within NAMAs. As the first NAMAs underway are evaluated, developed, implemented and eventually their performance measured, their anticipated evolution closer to the mainstream should provide a useful window showcasing various forms of private sector engagement and the resulting real time harvesting of opportunities. An example of a success in early involvement of private sector is the Brazilian NAMA for the electricity sector that came about with the Jirau Hydropower Project, a 3750 MW run-of-river project currently being implemented. The project has greatly contributed to



the development of the NAMA, which paves the way for similar projects and investments.

In practice engaging the private and financial sectors has been a significant challenge. Today NAMAs and their catalytic potential are still not fully appreciated or understood by local and even multinational private sector actors. Changing this reality will require a close interaction and working relationship between relevant ministries, private sector actors and multilateral agencies.

The CDM provides an important example on this front as the business community pro-actively engaged to shape and aid in its development, implementation and various stages of growing pains. There is a similar opportunity for the private sector to engage and impact NAMA design as well as lead and contribute towards the implementation of NAMA specific initiatives. This opportunity should not be ignored.

An early and proactive engagement of private sector actors can help shape NAMAs in a way that would open up new markets and create business opportunities that were not previously attractive. The challenges and obstacles identified at this early stage of NAMA design and implementation must however be addressed in a collaborative fashion by interested parties, including an understanding and incorporation of the private sector.

As the global carbon market is almost on standby, NAMAs have the potential to generate significant and lasting emission reductions, facilitate the strengthening of process and structures to ease private sector financing, and rekindle the prospect of climate-driven income streams to complement project cash flows, results and rates of return. For that NAMAs need to tackle development and climate challenges together and build on synergies between them. NAMAs must make development sense in the eyes of the public sector as well as business sense to appeal to the private sector.

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Frédéric Gagnon-Lebrun is the former VP – Business Development at ÉcoRessources Inc, where for the past ten years he spearheaded and grew the company's climate change and carbon markets practice. Before launching ÉcoRessources, Mr. Gagnon-Lebrun worked on climate change issues at the OECD, in government and in a research institute. He is an Associate at the International Institute for Sustainable Development (IISD) and holds an MSc in Environment and Development from the London School of Economics and Political Science (LSE).

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ÉCO RESSOURCES

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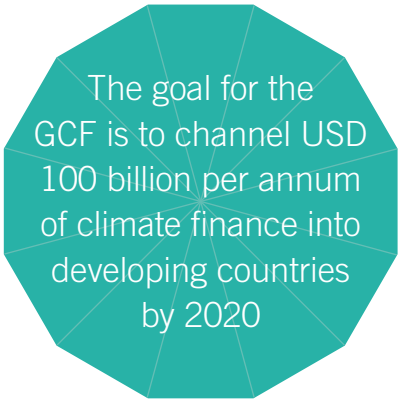
THE GREEN CLIMATE FUND: PARADIGM SHIFT OR INCREMENTAL IMPROVEMENT?

Many people are aware of the establishment of the Green Climate Fund (GCF) as part of the negotiations towards a new global climate agreement. Most understand that the Fund will be an essential part of any such agreement that may be struck in 2015. The GCF was agreed at the Cancun Committee of Parties (COP) in 2010, designed by a transitional committee of 40 members during 2011, and its Governing Instrument was sanctioned at the Durban COP in 2012. But precisely what the Fund will do, how it will operate, and what effect it will have remains to be determined through the deliberations of its Board.

One element of critical interest is the intention to build into the Fund from its outset significant private sector input. Two Active Private Sector Observers (ASPOs) attend meetings of the Fund's Board and may intervene in deliberations at the discretion of the co-Chairs. The current APSOs are Abyd Karmali of Bank of America Merrill Lynch and Gwen Andrews of Alstom. We are joined by two Active Civil Society Observers: Brandon Wu of Action Aid and Meena Raman of the Third World Network. Of more importance than observers, there is a Private Sector Facility within the Fund's structure, and a Private Sector Advisory Group (PSAG) will be established to make recommendations to the Fund. Both these elements are discussed below.

The Governing Instrument of the Green Climate Fund states that the Fund will "play a key role in channeling new, additional, adequate and predictable financial resources to developing countries and will catalyse climate finance, both public and private, and at the international and national levels". The goal for the Fund is to channel USD100 billion per annum of climate finance into developing countries by 2020. The Governing Instrument foresees that the Fund will "promote the paradigm shift towards low emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change", and will direct its resources particularly towards those countries most vulnerable to climate change. These include Least Developed Countries (LDCs), Small Island Developing States and African States. The Fund is also expected to achieve "a balance" between mitigation and adaptation activities, though this has yet to be defined.



The GCF Board is comprised of 24 members, twelve from Annex 1 countries under the UNFCCC and 12 from non-Annex 1 countries. Its deliberations are guided by two elected co-Chairs, one each from the developed and developing country constituencies. For the first five meetings of the Board, they have been Ewen McDonald of Australia and Zaheer Fakir of South Africa. At the Board meeting in Paris in October 2013, new co-Chairs were elected: Manfred Konukiewitz from Germany and Joey Saloeda from the Philippines. The Fund headquarters will be in Songdo, Korea. The Korean government is providing support, and is planning an official launch for the first week in December 2013.

One key decision taken by the Board at its fourth meeting in Songdo in June 2013 was the appointment of an Executive Director of the Fund. She is Hela Chiekrhouhou, previously of the African Development Bank. With the Headquarters agreement finalised with the Korean government and the appointment of an Executive Director, the transition from an interim Secretariat provided by the UNFCCC in Bonn to a permanent Secretariat can take place. Recruitment has begun for an initial cadre of 38 senior and administrative staff. In Paris, the Board agreed a staffing structure for the Secretariat, which will include units dedicated to Mitigation and Adaptation, External Affairs, Country Programming, the Private Sector Facility and Support Services. The budget for 2014 has been set at USD$18.9 million, with the co-Chairs expressing a high level of confidence that contributions would be available to meet this.

In addition to the necessary administrative decisions, the Board has been deliberating on the Business Model Framework for the Fund – in essence, how it will operate. Various critical decisions are being worked through that relate to issues such as the financial inputs that the Fund can receive, the means of resource mobilisation, how to operationalise the principle of country ownership of the Fund's activities, which activities the Fund will invest in, and how it will measure its impact.

The parameters of the Fund's operations are beginning to emerge from these discussions. It has been decided that the Fund will operate on a wholesale basis through intermediaries, rather than be capitalised initially as a bank. Accreditation procedures for intermediaries are being developed. Initial intermediaries are likely to be multilateral development banks and financial institutions, with national and even sub-national entities eventually being accredited as well. In Paris, it was agreed that the Fund could accept financial inputs that included grants from public and private sources, concessional loans and paid in capital contributions from public sources, and additional types of inputs as decided at a later stage by the Board. Minimum requirements were set that would allow donor nations to begin making financial commitments to the Fund. These include:

- A structure for the Fund and the Secretariat, including administrative policies, best practice fiduciary principles and standards, and environmental and social safeguards;
- Financial risk management and investment frameworks
- Initial result areas, core performance indicators and results management framework;
- Accreditation procedures for intermediaries;
- Policies and procedures for initial allocation of resources;
- Processes for approving proposals and criteria for funding programme and project proposals;
- Initial modalities for operation of the mitigation, adaptation and Private Sector windows
- Terms of reference for the independent evaluation unit, integrity unit and redress mechanism.

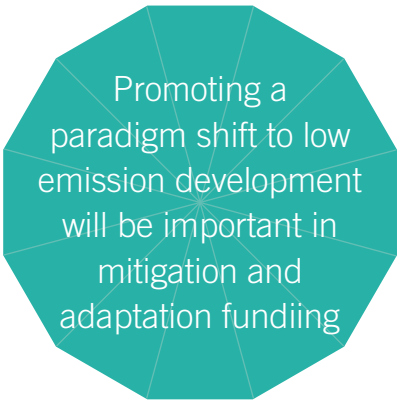
Once the minimum definition of the Fund's business model is completed, a pledging meeting will take place. This is likely to occur sometime in mid 2014.

One important matter that was confirmed in Paris is the arrangement between the Fund and its umbrella body, the Conference of the Parties. Although the Fund will report annually to the COP and accept guidance from the COP, the Board will be fully responsible for decisions relating to the Fund. The COP will not be able to reverse any decision on investment or other matters.

The principle of country ownership underlies all the activities of the Fund, An architecture has been agreed that will support this, based on the establishment in each country of nationally designated entities that will have the responsibility of communicating with the Fund, forwarding proposals for investment, and ensuring no objection on the part of the recipient country to activities supported by the Fund.

In terms of investments, the Board decided that the Fund will adopt a theme and activity based approach to the allocation of resources. The three main themes relate to the Fund's objectives and structure – mitigation, adaptation and the Private Sector Facility. Promoting a paradigm shift to low emission development will be important in mitigation and adaptation funding, as will sustainable development. In terms of the Private Sector Facility, resources will be allocated to finance directly and indirectly private sector mitigation and adaptation activities and to promote the participation of private sector actors in developing countries.

Initial results areas for investment in mitigation activities include city design and planning; energy efficiency of buildings, appliances and industrial processes; low emissions transport; small, medium and large scale low emission power generation; low emission energy access; sustainable land and forest management and REDD+. In adaptation, activities include reducing climate related vulnerabilities, selected flagship activities, readiness and capacity building work, scaling up effective community based adaptation schemes, and supporting knowledge hubs. Initial performance indicators have been selected for these areas, though the decision makes it clear that the Fund, as a continuously learning institution, will maintain flexibility to refine its result areas and performance indicators.



A critical part of the Fund, and the element that sets it apart from other climate finance initiatives, is the Private Sector Facility (PSF). From the beginning, it was recognised that the amount of fund-

ing targeted for investment in developing countries was unlikely to be provided from public sources alone. The Private Sector Facility will be established as a tool that works across the Fund's activities as a whole, seeking ways to use public funds to leverage more private sector funds into clean energy and clean development in recipient countries. To do this, it will be necessary for the public funds to help buy down risk for private investors. Although the Fund will initially operate through grants and concessional loans to financial intermediaries, the Board has agreed that it will consider in 2014 other financial instruments that the Fund can use. These may include, for example, loan guarantees, insurances (including policy insurance), and structured debt in which different tranches of risk are identified. The PSF may also be able to assist the Fund with accumulating financial resources, for example through bond issues and eventually, packaging performing assets into investment funds to recycle resources.

The Secretariat unit that supports the Private Sector Facility will include experts in structured finance, project finance, guarantees and insurances, and financial intermediation. In addition, the Board agreed that a Private Sector Advisory Group (PSAG) should be established to make recommendations to the Board on the operation of the PSF as well as on the Fund's investment and risk management strategies. That Group will be composed of two Board members from developing countries and two from developed countries, and four private sector advisors from developing countries and four from developed countries. The Group is expected to meet several times per year, via video conference where possible. The Active Private Sector Observers and the Active Civil Society Observers on the Board may also attend the meetings. Nominations are being sought for PSAG participants with expertise in climate finance and investment, in mobilising private sector investment in developing countries, or in private sector activities relating to low emission and climate resilient activities.

A unique opportunity exists for co-operation between the public and the private sector to meet the challenge of facilitating clean energy and clean development in developing countries. If that opportunity is to be realised, it is critical that the private sector provide its expertise in the design phase of the Fund as well as throughout its operation. More commercially viable private sector investments in projects and programmes will be the result.

[1] The Governing Instrument and other documents are available on the Fund's website: www.gcfund.net. / [2] Decisions of the Board are available on the Fund's website: www.gcfund.net.

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Gwen Andrews is Vice President, Environmental Policies and Global Advocacy at Alstom, a major global supplier of power generation and rail transport equipment. She carries out advocacy with governments throughout Asia and Oceania and is involved with customer relations and selected projects in countries including Australia, China, India and elsewhere in Asia. A high ranking bureaucrat in the Australian Government, Gwen was the first Chief Executive of the Australian Greenhouse Office from 1998 to 2002. Prior to that, she was General Manager, Budget at the Department of Finance and Administration and held a number of other positions in the Senior Executive Service. Between 2002 and 2007 she was Managing Director of a council in Hampshire, UK, and used her expertise to contribute to sustainable development planning issues on a regional level. Gwen is a director of the Carbon Market Institute, which assists Australian businesses to understand and engage in the carbon market. She is also a member of the Energy Reference Group of the Grattan Institute, and a Graduate Member of the Australian Institute of Company Directors.

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A CDM CAPACITY FUND - WHAT WOULD IT TAKE?

The UN High Level Panel on the Policy Dialogue on the Clean Development Mechanism (CDM), which reported in September 2012, said as the first of its recommendations that parties must 'urgently address the immediate crisis of demand' to ensure that the CDM, and more generally, confidence in global carbon markets, would continue to help mitigation efforts in addressing climate change. The Panel identified increasing mitigation ambitions as the principal and most sustainable way to resolve the problem. In particular, the Panel made clear that, without action to address the crisis in demand, its numerous recommendations for strengthening and streamlining the operation of the CDM would be irrelevant, and the CDM would not be available to play the role of 'essential bridge to future solutions'.

In addition to the focus on increasing mitigation ambitions, the panel suggested two other palliatives. The first was to allow wider access to the use of Certified Emission Reductions (CERs). The second was that parties should 'investigate the establishment of a new fund and/or enable existing or emerging funds to purchase and cancel part of the overhang of CER's' as an interim way of addressing the supply/demand imbalance.

Since the Report was published, the CDM market has continued to weaken; and while there are hopes of a new agreement with (possibly nationally based) commitments to greater levels of mitigation effort, any increase in demand is some way off.

If the expertise and capacity provided by the CDM is to continue to be available for support to the New Market Mechanism, which many hope will be agreed in 2015, it is timely to return to the notion of a Fund and examine what it might entail in terms of resources and how it might operate.

Acting in a personal capacity, and with the help of some colleagues, I have been investigating what might be the features of a Fund, and who might be prepared to contribute to it.

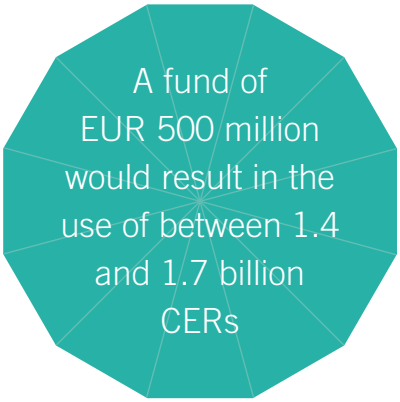
Our first step, with logistical support from the International Emissions Trading Association (IETA), was to convene an expert workshop involving project developers, the financial community, development banks and government representatives.

Topics discussed were

- The appropriate relationships between the fund and project developers
- The selection of and restrictions for project types
- Governance arrangements
- The use of CERs acquired (retirement vs future targets)
- Potential investors
- The Fund's position alongside other multi-lateral activity including the Green Climate Fund (GCF)

A briefing paper was subsequently produced covering these topics as a contribution to the debate ahead of COP18.

Crucial to the prospects for a Fund, and the willingness of potential investors to participate, would be a feel for its likely impact and how big it would need to be to make a worthwhile difference. To this end, the group worked up terms of reference for a study, which the UNFCCC agreed to sponsor, and which was carried out by Vivid Economics entitled 'The market impact of a CDM capacity fund', published in June of this year .



The rest of this article looks at the findings of that report in the context of the negotiations on the Framework for Various Approaches/New Market Mechanisms (FVA/NMM).

The market impact of a CDM capacity fund

The Report looks first at a Fund applying to existing projects. It finds that a fund purchasing from existing projects and paying the market price could clear large volumes of CERs, and thus significantly reduce the demand/supply

imbalance. Specifically, a Fund of EUR 500 million would result in the use of between 1.4 billion and 1.7 billion CER's, although it would have very little impact on CER prices, which are estimated to remain below EUR 0.4.

To make an appreciable impact on CER prices would either require a very large Fund, or a Fund structured to pay different prices for different credits, depending on their marginal issuance costs. With such an approach, a Fund of about EUR 2.5-EUR 3.0 billion would be able to purchase around 4.6 billion CERs - sufficient to eliminate the entire current supply overhang – and to raise CER prices to EUR 2.50.

The report also analyses the impact of restricting purchases to specific project types (eg only purchasing from LDCs), which would have a significant uplift in prices for these projects. However, with a narrow purchasing mandate, the CDM's contribution to the goals of retaining human and physical expertise and generating a pipeline of future mitigation projects may be less significant (albeit that it may possibly support other goals such as correcting for the historic imbalance in the coverage of the CDM, or contributing to the delivery of clean energy services where they are currently lacking).

A different approach was adopted for the analysis of a Fund dedicated exclusively to purchasing CER's from new projects, which by definition entail much greater uncertainty over likely levels of supply.

Such a Fund could be constructed in a variety of ways. The Report looks at three different options - one based around a specified level of revenue, one based on a specified quantity of emission reduction, and one which guarantees a price floor. It shows that in all three cases a Fund of EUR 200 million could deliver significant additional abatement. Further analysis shows that the 'price floor' model is more resilient than the others to changes in demand. It should be noted that the 'price floor' model involves placing demand side risk with those capitalising the Fund, who may be best placed to manage it. This could be an important consideration, given the uncertainty surrounding future demand - which is likely, regrettably, to persist certainly to the signing of an agreement in 2015and possibly beyond, as implementation efforts build up.

Conclusion

The analysis by Vivid Economics illustrates that a Fund as envisaged by the High level Panel and, more recently, by others, could have a significant impact on market price and project viability. This would be at funding levels of EUR 3 billion or below if it extends to existing projects, or even EUR 200 million if confined to new projects - and provided the design were tailored to the goals sought for the intervention by the Fund.

If these goals are primarily to retain capacity in monitoring and verification, an 'existing project' Fund of EUR 500 million would have a material impact. It would not, however, raise prices sufficiently to drive new mitigation activity in developing countries and, hence, retain CDM origination capacity. In that sense, it would result in a gap between the operation of the CDM and the full implementation of a New Market mechanism. A larger 'existing project' Fund would be needed to incentivise new mitigation activity and retain origination capacity. But, with either or both price discrimination and a selective approach to the types of projects supported built into the design, these benefits might be secured at sums of about EUR 2.5- EUR 3 billion. Care, however, would be needed to avoid fragmenting the market or substituting political fashion in the selection of mitigation projects for a market judgement on which projects are the most cost effective to pursue.

If the primary emphasis is on taking up affordable abatement opportunities in developing countries from now until any NMM becomes fully operational, a 'new projects' Fund could be the way forward. This would send the signal to developers that the market would continue to exist, without an interregnum, pending the coming into operation of the NMM after 2020. With such a Fund, a design incorporating a price floor would seem to offer better value for money than one based solely on either a quantity commitment or a revenue commitment - although it should be noted that a revenue cap might be needed to give assurance to donors. In that case, it could readily be added to a Fund based on maintaining a price floor.

The choice between the two types of fund will depend on factors such as barriers to entry in the market and the length of time project origination takes. Undoubtedly a 'new project' Fund is preferable where barriers to entry are low and projects can be originated quickly. Another issue concerns how important carbon prices are to the viability of existing projects. If a modest uplift in CER prices would make the difference to many existing projects, then an 'existing project' Fund would deliver emission reductions and sustainable development benefits which would otherwise be lost.

Either model of the Fund could create momentum for setting up an NMM- for example, through tying the purchase of credits to the requirement for a host country to commit to reductions below business as usual (likely to be one of the advanced industrialising countries). Other possible design features could also be trialled, which could inform the way in which an NMM is developed.

Comment

Most of what is said above is a direct lift from the Vivid work, and I am indebted to them and to my colleagues for all they have done to deepen the understanding of what a Fund might do and what it might look like, as well as to the UNFCCC for their support for the Vivid study. But the opinions and any errors are mine, as are the following remarks. History is littered with efforts to tackle complex problems - efforts which have failed fully to deliver, and either have taken too long to work at all or at least to become as effective as they need to be (and the CDM might arguably be considered an example of the latter). Some may have delivered benefits but at far too high a financial or other - say environmental - cost. There are few counter-examples of large initiatives which have worked smoothly from the start, and it is a triumph of optimism over experience to believe that an NMM of the level of ambition required to meet the challenge of climate change will be wholly successful from the outset. But, it is important that we give the NMM every chance of doing that. I believe this requires that we maintain the skills and capacities developed by project participants, host countries, and sovereigns who purchase CER's so that they are ready and willing to apply that experience and capability to the NMM. Unless we do that, we will add to the delay in identifying and executing emission reduction opportunities - a delay we can ill afford in tackling climate change.

Setting up a Fund of between EUR 200 million and EUR 3 billion for these purposes may seem expensive. But we must not overlook the gearing effect - that public funds here draw in private sector investment. The potential donors (sovereigns, industries wishing to purchase offsets until technology allows them to reconstruct their business models, such as aviation and shipping, or concerned individuals) should carefully consider that issue, as well as what it is likely to cost not to proceed. Looked at that way, the Fund might well seem to be very cheap at the price.

History is littered with efforts to tackle complex problems - efforts which have failed fully to deliver

About the Author(s):

Joan MacNaughton CB HonFEI is an influential figure in the energy and climate debate. She is Executive Chair of the World Energy Trilemma for the World Energy Council, an annual assessment of the quality of 129 countries' energy policies. She is Past President and an Honorary Fellow of the Energy Institute (the learned society for energy professionals in the UK), and a Trustee of The Climate Group. She is a Senior Research Fellow at the Oxford Institute of Energy Studies, chairs the international Advisory Board of the Energy Academy of Europe, and is a member of a similar Board at University College London. She is also a member of the Advisory Council of the Joint Institute for Strategic Energy Analysis in the US. In 2012 she served as Vice Chair of the UN High level Panel on the Policy Dialogue on the CDM. She frequently lectures, and acts as a moderator of discussions, on a wide range of energy and climate topics. For example, in April she moderated a Ministerial/private sector round-table at the Clean Energy Ministerial meeting, at the request of the US Government. From 2002, as Director General of Energy for the UK (the country's senior official responsible for all energy policy), she played a key role in shaping UK policy nationally and internationally, leading the work on the energy aspects of the climate proposals agreed at the G8 Gleneagles summit in 2005, and overseeing the energy agenda during the UK Presidency of the EU. She was the Chair of the Governing Board of the International Energy Agency from 2004 to 2006,leading a review of the Agency's strategy and the activation of the emergency response to Hurricane Katrina. On leaving government, she had a second career in business, creating a policy department for Alstom (a global engineering company) and spearheading its advocacy for clean sustainable energy, culminating in a year as the company's Global Adviser on Sustainable Policies. She has chaired or served on numerous boards such as the Board of Governors for Argonne National Energy Lab at the University of Chicago, where she chaired the Budget Committee, the International Emissions Trading Association (of which she is now a Fellow), the GCCSI, CCSA, and many others outside the energy sector. She has served as a Non-Executive director of a FTSE company. She was made a Companion of the Order of the Bath by HM The Queen in 2006.

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TOWARDS SUPRANATIONAL CLIMATE LEVY? THE CASE OF THE ADAPTATION FUND INTRO

The Kyoto Protocol requires that a proportion of the proceeds from CDM project activities be retained by the Executive Board for two purposes: a) to assist with the administrative expenses of the Executive Board and other bodies involved in the Protocol framework (the Administration Share of Proceeds); and b) to fund measures in developing country Parties to the Protocol that will assist them in adapting to the adverse effects of climate change (the Adaptation Share of Proceeds).

In other words, Article 12(8) of the Kyoto Protocol provides sources of finance to cover administrative expenses as well as to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation (Kyoto Protocol, Article 12(8)).

The above legislative passage is well known by every CDM developer who had to part with a share of their proceeds (SOP). However, some issues relating to it are less discussed, such as:

- What happens to the surrendered carbon credits?
- Whether the mechanism proved effective in assisting the adaptation efforts
- What are the implications of the extension of "Share of Proceeds" policy. Following the decision at CMP 8 in Doha, the rule is to be applied to other transfers of carbon units.

Finally, and more fundamentally, the question begs itself whether this policy is shaping up as a supranational climate tax and if so, does it have a place in a new global climate agreement.

What happened to the surrendered carbon credits and was it effective

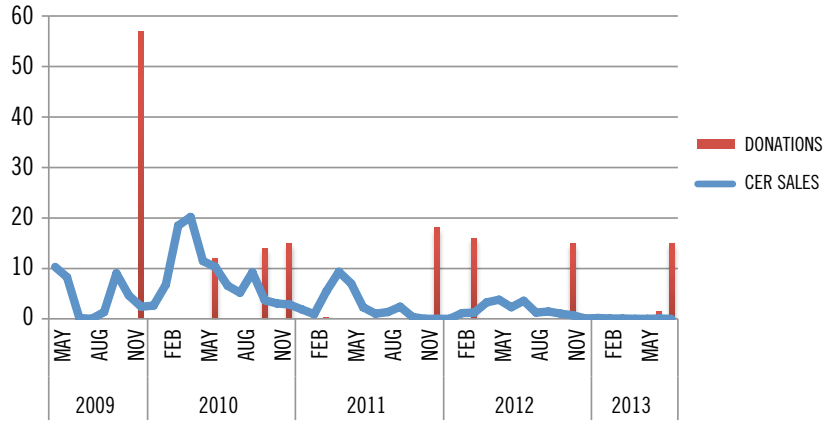
The above mentioned legislation created a much needed but unprecedented international public finance source for climate adaptation. Adaptation finance is difficult - not least because the scale of climate effects is unpredictable. Identifying the right areas of intervention that would strengthen the resilience and reduce the vulnerability of countries whether responding to sea level rise, water shortages, more volatile weather etc are also challenging. To that end, an innovative Adaptation Fund was established in 2007 that is responsible for streaming the generated finance to concrete adaptation projects and programmes in developing countries. The interim structure includes the Adaptation Fund board, with the Global Environmental Facility (GEF) as the Secretariat and International Bank for Reconstruction & Development (IBRD) as the Trustee.

The Adaptation fund is unique in two key aspects – the way it is financed and the way the money is distributed (governance and access to funds). The balance and equitability of governance is ensured by the composition of the Adaptation Fund Board. It is dominated by representatives of the developing countries with special seats given to country groups recognised as being particularly vulnerable to the adverse effects of climate change: the Least Developed Countries (LDCs) and the Small Island Developing States (SIDS). Furthermore, the fund provides a direct access to climate finance for national and regional entities and allows them to manage all aspects of the design and implementation of adaptation projects.

The Adaptation Fund is the first fund to be financed by an international revenue source that is created by the virtue of an internationally agreed climate policy framework. The share of proceeds, which amounts to 2% of certified emission reductions (CERs) issued for a CDM project activity, is not the only but by far the major source of the funding (Donations play a role as well). The mechanism worked well while CER prices were holding strong.

Although still in its formative years, The Adaptation Fund managed to fully develop a robust direct access mechanism with performance-based disbursement of funding tranches based on progress

ADAPTATION FUND - TWO REVENUE STREAMS (IN US$ MILLION)



Source: World Bank Trustee financial report, 2013

in achieving agreed results. There is also a swift project review cycle – it is typically just 9 weeks from project submission to funding decision.

The finance distribution process also strengthens the capacity of vulnerable developing countries to access adaptation financing, including those with little access to international adaptation funding. In 2012, the fund was ranked the number one climate institution internationally in the Aid Transparency Ranking. With 29 projects and programmes, worth a combined USD190 million approved and accredited entities in Africa, Asia, Latin America and the Caribbean, the Adaptation Fund shows a global reach and demonstrates that the share of proceeds 'retention' rule is, to some extent, a success.

In 2011, a thorough review of the effectiveness and adequacy of the Adaptation Fund (AF) and its interim institutional arrangements was undertaken. It concluded that duties and responsibilities have been carried out in an effective and efficient manner since its inception. However, the lack of jurisdiction over other elements of the Adaptation Fund's operations, such as CER stock control and Trustee investment management conformance with Board of Directors' investment risk appetite, was noted. Other observations revolved around strengthening the management of the board, increased control of Trustee's activities in monetizing share of proceeds, as well as additional control over project disbursement in anticipation of the Fund's operation expansion. Still, the expansion may never happen, as due to the falling carbon prices and market forces the primary revenue stream has been starved. This is jeopardising the effectiveness of the CER levy as a tool to finance adaptation.

Revenues for the Adaptation Fund started in May 2009 with the first sales of CERs netting USD10 million. The proceeds from CER sales through over the counter (OTC) transactions, on exchanges and auctioning were extremely impacted when CER prices fell steeply, starting in 2011. Prices have continued to decline, and the forecast for any meaningful recovery is highly uncertain. The Fund's revenues from CER sales have decreased dramatically, and are not expected to increase unless and until CER prices rise. The Fund's revenues from CER sales through June 2013 total USD188 million, with just USD19 million netted since January 2012.

In the face of diminishing funds from 'Share of Proceeds' mechanism, efforts have been made by the Adaptation Fund to attract more sovereign and private donations. The cash receipts from Donors and others sources, as of May 31, 2013, were over USD134 million. The Adaptation Fund Board decided to create a fundraising task force comprised of "Board members that work in conjunction with the secretariat on outreach, strategy, and other efforts to achieve the interim USD100 million

fundraising target by the end of 2013. (Decision B.19/29). As we approach the end of 2013, the goal is unlikely to be achieved.

The other lifeline for adaptation finance has been opened through the CMP 8 decision taken in Doha last year, whereby the 'Share of Proceeds' levy has been extended to other offsets under the Kyoto Protocol. The decision notes that for the second commitment period of the Kyoto Protocol, the Adaptation Fund shall be further augmented through a 2% share of the proceeds levied on the first international transfers of AAUs and the issuance of ERUs for Article 6 projects immediately upon the conversion to ERUs of AAUs or RMUs previously held by Parties. Unfortunately, it will take years before this has any effect on the Adaptation Fund finances and in the absence of clarity on the global climate regime post 2020, the relevance of this decision might be limited.

There are political as well as technical challenges in the implementation of the levy. Where to host the account accumulating the additional levy and how to ensure adequate tracking and enforcement of the 2% levy. So the infrastructure for levying, holding and monetizing those carbon credits has to be created. There are many areas of difficulty and ambiguity in the proposed new levy system. Political choices will have to be made such as who is to supervise and how to pay for the system. The AAU levy is particularly sticky. While ERU and RMU issuances are similar to CERs, in that they result from concrete projects and have some sort of the UNFCCC supervision, AAUs historically were traded completely on the basis of bilateral - and typically confidential - agreements. It is difficult to see how keen the Parties will be to give up such discretion.

More worryingly new revenues might never come. ERUs are already trading at a discount to CER prices. AAUs have no liquid price at all. There is a large surplus of credits and only Parties to the Kyoto Protocol, as well as compliance buyers from a few other domestic markets such as Japan or New Zealand create the limited demand. The question is then how much real value can be gained by the expensive exercise of extending the 'levy' on Kyoto mechanisms. It is also questionable how relevant this is, in the light of new global climate agreement that is supposed to come into force in 2020.

Supranational climate tax in the future

At the time of writing of this article, it is still unclear what will be the shape of new market and non-market mechanisms under the new global climate agreement and whether they will be able to serve as international public climate finance. As the UNFCCC workshop in Bonn in October showed, progress is slow to emerge. A number of negotiating parties expressed the desire to see transactions being levied, but actual modalities or numbers have not been discussed. It is also important to note that the question of the future "Share of Proceeds" is firmly linked to the broader considerations of institutional arrangements of climate finance and the role of Adaptation Fund within or alongside the Green Climate Fund (GCF) and the destiny of Kyoto Protocol carbon market mechanisms post 2020.

Conclusion

From the brief overview of the Adaptation Fund case, it is obvious that a supranational levy on carbon trade as an international public revenue source can provide vital resources for adaptation and capacity building, where private finance is scarce. And indeed judging from the IPCCC 5th Assessment Report, with escalating adverse effects of the climate change, we will require more money to fight climate change. The "Share of Proceeds" rule or supranational climate levy, which has become an elaborate de facto carbon tax under the Kyoto Protocol, if broadened post 2020 and in the new agreement could be part of the answer. But the effectiveness of such levy depends and will continue to depend on the strength of mechanisms, the markets to deliver price and revenues and robust policy structure as their foundation.

About the Author(s):

Laura Dzelzyte has years of international climate experience at a senior political and executive level working as a climate finance expert and as the UN climate negotiator. The head of the Lithuanian delegation 2009-2010 in the UNFCCC process and now adviser to the Lithuanian government during the EU presidency, she continues participating in the international climate negotiations, commenting and publishing on climate issues and carbon markets. In 2011, Laura has been elected as the member of UN Adaptation Fund board, representing Eastern European Regional Group and now serves as the chair of the Programmes and Projects Committee. Laura is also a member of the Young Atlanticist Programme of the Atlantic Council and is involved in promoting liberal education.

AUTHOR(S):
Gray Taylor, Bennett Jones

PRIVATE SECTOR FINANCE FOR ADAPTATION

This brief paper examines the pressing topic of engaging the private sector in adaptation financing. With few examples to draw from, the paper relies primarily on first principles and analogy to draw its conclusions. It is hoped that a year from now, such statements will not be needed.

The Need for Private Sector Adaptation Financing

The need for private sector finance for adaptation is simple to demonstrate.

The climate is changing as a result of anthropogenic greenhouse gases (GHGs) being emitted into the atmosphere at rates faster than the ecological systems can remove them. Atmospheric accumulation of GHGs causes changes to climate, many of which are destructive, including heat waves, coastal and inland flooding, intense precipitation events, droughts, and other extreme weather events.

The ultimate extent of these impacts is not known, partially as a result of knowledge gaps in understanding the consequences of accumulating GHGs, but also of the inability to predict the success of efforts to mitigate GHG emissions. However, the GHG contents of the atmosphere today are unlikely to be reduced over the next few decades, and instead it seems that they may increase. Since current levels will have adverse impacts, and any higher levels in the future will increase these effects, the need to adapt to climate change cannot be avoided.

The adverse impacts from climate change will require humans to expend resources to plan and implement ways to "live with climate change." These ways are often referred to as adaptation.

Historically, government has often dealt with tasks requiring a societal response to a pressing problem. Earthquakes, tsunamis, international aggression and smog are examples. But, in the case of climate change adaptation, two unusual aspects present themselves:

1. Governments appear not to have the financial capacity to undertake the 'mega-programs' needed to plan and implement adaptation, and
2. The size of the problem is arguably unprecedented and the costs staggering, with estimates of USD 50 billion to USD 100 billion per year commonplace.

As a result, it appears the task of financing adaptation requires significant outsourcing to the private sector.

Problems in Obtaining Private Sector Adaptation Financing

The private sector is, by definition, motivated by profit, and is therefore unlikely to invest in the absence of a sufficient return on investment (ROI). Adaptation addresses the loss of value as a result of climate change, not the creation of additional value as is usually the case for private investment. It therefore appears to be inherently contradictory for the private sector to finance adaptation.

This difficulty has already been encountered for mitigating climate change. Actions to reduce GHG emissions or to increase the removal of GHGs from the atmosphere need to derive a return from the avoidance of damage caused by climate change. As a result, private sector capital has not been easily mobilised to finance mitigation activities. Indeed, the threat or existence of government programs to require mitigation activities in the business sector has been the most successful tool in inducing the private sector to participate in GHG reduction projects and activities. Examples include the Kyoto Protocol Clean Development Mechanism (CDM), which incentivises the private sector to develop projects in developing countries to facilitate lower cost emission reductions by developed countries. Similar projects exist in Alberta, driven by GHG emissions intensity reductions imposed on large industrial facilities.

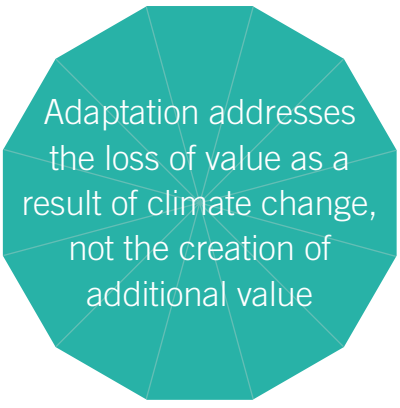
The private sector has participated in financing climate change mitigation projects in the absence of legislation to some extent where other business objectives can be accomplished. For example, insurers have occasionally been support-

ive of climate change projects aimed at reducing the risk of damage covered by their insurance. Additionally, retailers see reputational and capacity-building potential in supporting voluntary carbon markets. As a result, it is not impossible to conceive of the private sector taking the necessary steps to provide financing for adaptation projects and activities.

Possible Sources of Private Sector Finance

CONSULTANTS AND CONTRACTORS

One approach to mobilising private sector capital in adaptation projects and activities is to find businesses which can profit directly from participating in those projects and activities. These businesses should, for example, be identifying opportunities for adaptation projects and attempting to show that the project's ROI justifies it. Obtaining sufficient financing from such entities would seem unlikely, however, as the amount required is far in excess of their capabilities. Nevertheless, their participation in finding opportunities and presenting ROI analyses should be encouraged.



INSURANCE

A source that offers some hope of resolving part of the difficulty is the insurance sector. Insurance companies collect funds from large number of participants facing a risk that will happen, it is theorised, to only a portion of them. It is in the best interest of those companies to avoid the occurrence of the adverse events covered by the insurance. This helps explain the interest of insurance companies (and re-insurers of those companies) in reducing GHG emissions. But it should be equally in their interest to take action to minimise or avoid the damage GHGs otherwise cause. This works if the cost of minimising climate change damages is less than the present value of the avoided climate change damages covered by the insurance.

It should be cost effective for insurance companies to take steps to understand the risks created by the climate change to their insureds, and facilitate actions that have "adaptive" effects. For example, property insurance companies suffer significant losses when intense rain events and/or floods cause damage to insured houses. To prevent sewer backups into basements (which are frequent causes of insurance claims after such events), insurers are supporting the installation of "back check valves" in sewer lines.

PUBLIC PRIVATE PARTNERSHIPS AND GOVERNMENT OWNED/ SUPPORTED BUSINESSES

Although controversial, it is difficult to dismiss the potential for government owned or supported businesses (GOSBs) or private public partnerships (P3s) to finance adaptation.

Adaptation projects may have a present value significantly greater than their implementation costs. For example, a highway in the Arctic built on permafrost can expect a succession of large, costly repairs to deal with the buckling of the highway as the permafrost melts. This is avoided if the highway is made climate change resilient through construction involving the use of insulation and "thermopiles" designed to preserve the permafrost under the highway. The present value of the avoided repair costs, as well as the wider economic costs of highway disruptions, can far exceed the upfront costs. In those circumstances, a government could create a P3 or GOSB, relying on either a government guarantee to make payments over a time period (paid by the avoided repair expenses) or on a stream of payments from users of the highway designed to recover some of the benefits to them. These mechanisms offer significant potential to attract private sector capital to accomplish adaptation goals.

GEOGRAPHIC BASIS FOR BUSINESS INITIATIVES

Adaptation has one major advantage over mitigation that may make private sector financing comparatively easier. The benefits conferred by successful adaptation action often have concentrated, local impacts. Therefore those who benefit can be more readily identified than is the case with mitigation, where the consequences are intermediated by the atmosphere and delivered around the globe. This means that those who benefit from a successful adaptation project and should therefore be willing to contribute to the cost of the project should be identifiable with some degree of precision.

For example, a sea wall designed to keep out rising seas from a city should deliver direct benefits, as storm surges are avoided and flooding reduced. This avoids repair, reconstruction, removal or protective action costs in the future and potentially reduces insurance premiums also. The mechanism to gather those contributions from the beneficiaries could be a tax imposed by the local government, or as sophisticated as an insurance scheme implemented by insurers and other financial institutions with mortgages or other interests in the area.

Adaptation Credit Trading

In the mitigation area, the greatest success in mobilising private capital into projects designed to cause GHG emission reductions is probably the CDM.

Through the creation of an artificial demand for emission reductions from CDM projects, a price for successful mitigation was created which motivated the private sector to provide billions of dollars for those projects.

It is worth discussing if a similar need for "adaptation credits" could be created to motivate the private sector to invest in adaptation projects. There are significant obstacles to the creation of such a scheme. It is necessary to find a way to quantify adaptation benefits from adaptation projects to value them for both the producer and purchaser; this is a far more onerous task than determining the amount of GHG emissions avoided or sequestered by a mitigation project. As well, which entities would be required to purchase adaptation credits?

Involving Private Sector in Adaptation Finance Planning

It has been noted that private finance, when examining a climate change project, is quite indifferent to whether the project is for mitigation or adaptation purposes. Indeed, in most cases, the private sector is indifferent to whether the project is climate change related, as only the risk adjusted ROI is ultimately relevant. Until capital pools have an allocation of their overall investments dedicated to mitigation or adaptation, the key will be to structure adaptation projects in a way that has an attractive ROI for private sector finance.

Private sector finance is not monolithic and, even in its current form, uses widely differing models depending upon the needs of those providing capital. Pension plans and insurance companies have longer-term requirements and thus are amenable to investments structured with them in mind. One would expect that adaptation projects would fit that mould.

Tying Adaptation Financing to GHG Emissions

One mechanism for financing the required adaptation is to place the cost on emitters. The emission of GHGs is widely viewed as having adverse effects on ecosystems and thus imposing a "social cost". The size of the social cost is open to debate, but there are estimates used in the US and Canada for regulatory purposes that range from CAD 30/tonne and as high as CAD 100/tonne or more. A carbon tax (such as the one used in British Columbia of CAD 30/tonne on CO_2 emitted from the combustion of fossil fuels) generates a stream of income to the government directly from those emissions. Some of this funding could be directed into adaptation efforts. An example of the mechanism being used, although only in a modest way, involves the Climate Change and Emissions Management Fund, founded by the Alberta government and funded by payments for "fund credits" purchased by emitters from the Alberta government to bring their GHG emissions intensity down to prescribed levels. Fund credits cost CAD 15/tonne and aggregate purchases from July 2007 to December 2012 total over CAD 300 million. While the vast majority of those funds have been invested in mitigation technologies and projects, a portion has been spent in the adaptation area, creating a model that can readily be adopted by others. Indeed auction revenues in a cap-and-trade system or a share of proceeds from offset sales into the system (like the deduction from CDM CERs as they are created) could be used to fund adaptation activities. Perhaps this mechanism could be used to partially fund the Green Climate Fund?

Conclusion

It is only possible to describe how private sector finance can support climate change adaptation in the most general terms. However, the need is great and the private sector is creative. Involvement of the private sector in planning activities and initiatives in this area has much to recommend it. For this reason, governments and institutions should create an extensive and careful dialogue with the private sector in order to create the necessary conditions to induce private financing. A good example is the Green Climate Fund (GCF), which explicitly acknowledges the need for private sector involvement, including the creation of a private sector facility/window for the GCF. We need much more of this and very soon.

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