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GHG. 2015/16 EXECUTIVE SUMMARY

MAKING WAVES

GREENHOUSE GAS MARKET **2015/16**

MAKING WAVES

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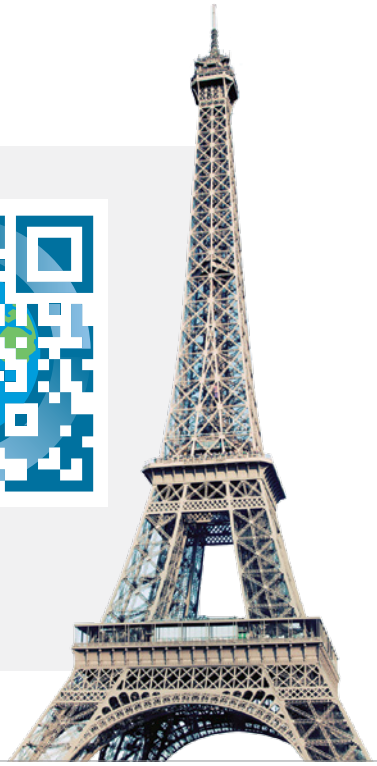

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MAKING WAVES: LET'S MAKE SOME NOISE

Business is ready to amp up its efforts in cutting emissions – the right policy framework can truly unleash the power of markets to combat climate change. Paris is the opportunity to set the course for years to come and create the right signals, says Dirk Forrister

This year is pivotal for climate change policy. With the Paris climate summit and follow-on activities across 2016, the business community will hear a signal of change. It will respond in a measure corresponding to the clarity of the call. After a few years in the doldrums, many business leaders are ready to "make some waves" in protecting the climate – with new investments, technologies and market solutions.

We've grown all too familiar with bad signals. "Can you hear me now? Can you hear me now?" Whether it is a mobile phone, a Wi-Fi connection or a television signal, we know that a clear signal can make it all work. But a muddled signal means delay, frustration and anxiety.

To be frank, after a four-year negotiating process began in Durban in 2011, the signals from Doha, Warsaw and Lima were pretty weak. Will Paris be any different?

As 2015 began, the scientific community – led by the Intergovernmental Panel on Climate Change – had already signalled the powerful need for action. Limiting the average global warming this century to 2°C could protect against the worst outcomes. This implied maintaining a carbon budget of no more than 1 trillion tonnes of CO2 equivalent since the industrial revolution – roughly equal to concentration levels of 450 parts per million in the atmosphere.

These numbers might not resonate with the general public, but business leaders should be educated enough to appreciate what it means for growth prospects in key regions. Given fossil fuel usage rates, countries will need to cut emissions at a massive level – as much as 80–90% below 1990 levels in the developed world and 50% from major developing countries. That means huge deployment of renewables – and use of serious levels of carbon capture and storage as well as storage in forests. It will also reward entrepreneurs who bring new innovations to a market hungry for a low-carbon era.

INDCs WILL SHAPE THE NEXT POLICY WAVE – AND COULD PROMPT A LARGE CHUNK OF THE NEW BUSINESS OPPORTUNITIES

Business listened throughout the year for new signals from policy-makers, just to see if they would truly rise to the challenge laid down by science. How much action would be undertaken? How would national responses be structured? How would policy seek to attract investment to the action?

The Paris "signal" finally began to gather its strength at the end of March, with the first set of Intended Nationally Developed Contributions (INDCs). By October, the signal was stronger as over 150 countries had expressed their intentions. These INDCs will shape the next policy wave – and they could prompt a large chunk

of the new business opportunities and investment in climate action and protection in the 2020s.

Business leaders continue to assess the force build behind this wave of policy-making, because it is sometimes drowned out by louder policy challenges – the refugee crisis, the Syrian conflict, elections and political polarisation. Will policy-makers stick to their aspirations? Or will the "intended" levels slip in view of other priorities? Might Paris provide the momentum for even more change, perhaps through cooperative approaches?

Standing alone, the INDCs will likely fall short of the scientific need. But, taken together, they could stimulate a great deal of collective action – and on their face, they offer a path for doing even more through the power of markets. Over 70 INDCs indicate potential to do more ***IF*** *they gain access to carbon markets and climate finance.*

That means that the real strength of the Paris agreement will be in whether it offers the route to ***markets and finance*** *so many are seeking.*

Over the long haul, the Paris agreement should instil confidence in countries to cooperate on large-scale emissions control efforts, given the massive wave of clean energy investment needed to achieve the 2°C level of ambition. From the atmospheric perspective, national borders should not matter – and cooperative action is essential.

What kind of policy framework would accomplish that goal? What fundamental element of the Paris agreement would create a whole new wave of investment and partnership around the world, delivering the clean energy revolution?

History gives us the answer.

With an environmental problem as widespread as greenhouse gas emissions

THE MAGIC OF THE PARIS OUTCOME WILL BE IN HOW WELL IT UNDERGIRDS THE MARKETS OF THE FUTURE

– where the cost effective opportunities to reduce or store emissions do not appear evenly across the globe and where the technologies and financing are not available to all – it takes a carbon price to bring it all together.

That's why hundreds of businesses, organisations and governments joined forces this year to form the Carbon Pricing Leadership Coalition, to advocate pricing approaches that will make a difference.

Market mechanisms can produce the right price. Market mechanisms can deploy capital and technology efficiently across the globe. They did it before, they are doing it now – and they can do it even more powerfully in the future.

This edition looks into the history of carbon markets. It recalls that under the Kyoto Protocol, governments stimulated a tiny ripple of action with the early "prompt start" era of the Clean Development Mechanism (CDM). Eventually, with the Protocol's entry into force and the launch of the markets driven by the European Union's emissions trading system and Japanese voluntary commitments, international investments took off under the CDM and, later, Joint Implementation as others began to ride the wave of the early market. These responses to Kyoto's policy signal proved that markets can deliver the desired benefits.

As my friend Fred Krupp describes in this edition, a new wave of market activity is underway. Major jurisdictions from China to the US and Canada are joining the EU in using emissions trading solutions to prompt new waves of investment. These programmes will report results under the Paris agreement – and they could grow even more robust through market linkages in the future.

That's why the magic of the Paris outcome will be in how well it undergirds the markets of the future – and how it helps them connect to do the enormous job ahead. The Paris package could unleash this wave of business opportunity, if the signal is clear and convincing. It also aims to sustain regular signals by establishing a mechanism for target setting for future phases of reductions, so a consistent pattern of reduction targets should emerge.

Most in the business community want to be part of the Wave of the Future on climate action. It appeals to the entrepreneurial nervous system that makes businesses come alive with creativity and ambition.

In some ways, it's not so much a problem of finance (there is tons of capital on the sidelines, looking to be put to work for good returns) or technology (many of the solutions are available and ready to be deployed) – it is a problem of signals and frameworks, which are the stuff of policy. Well, good policy that is! We can only hope that after Paris, you can see the wave building in terms of policy signals.

Like a surfer in the water, many businesses want to ride the "wave of the future" to experience the satisfaction of accomplishment. They know that building the market itself isn't the accomplishment; it is just necessary infrastructure. The true accomplishment will be achieving the emission reduction goals and delivering climate protection.

That will be the true legacy of Paris: if the signal is received and the goods delivered. And whether it will produce a new mode of cooperation through markets that can do the job faster and cheaper.

THE RIPPLE EFFECT

The past few years has seen emissions trading ripple out throughout the world. The Paris agreement is an opportunity to leverage these efforts to inspire greater ambition, say Fred Krupp and Nathaniel Keohane

Shared global prosperity depends on robust growth in the world economy — without the carbon emissions that have fuelled growth in the past. By capping and pricing carbon emissions, we can align economic incentives with lower-carbon growth to help achieve this vision. Market-based policies such as emissions trading channel capital and entrepreneurial effort to the fastest and cheapest ways to cut emissions, making deeper reductions possible.

It's not hard to see why many companies have been staunch supporters of emission trading. Indeed, the private sector — with IETA's leadership — has played a critical role in catalysing and championing market-based approaches. Well-designed carbon markets offer the combination of flexibility, incentives, and guaranteed results that ensures that pollution targets are met while leaving it up to the market to figure out the best way to meet them, driving costs down.

As advocates for the environment, meanwhile, Environmental Defense Fund has long championed markets because they can drive ambition *up*.

A good illustration of how market-based policies can promote greater ambition is the landmark US cap-and-trade programme for sulphur dioxide, which has reduced national average concentrations of the pollutant by 76% since 1990 — taking an enormous step toward solving the problem of acid rain ahead of schedule and well below the estimated cost while creating hundreds of billions of dollars in annual benefits. Market mechanisms also played central roles in the phase-out of lead from gasoline, the implementation of the Montreal Protocol, and the dramatic reduction in nitrous oxide pollution from power plants.

GLOBAL LEADERSHIP

More recently, momentum on carbon markets has been building fast. Cap and trade has helped California be a global leader in climate action. Nearly three years into the programme, California has the world's most comprehensive cap-and-trade system, covering 80-85% of state-wide emissions. At the same time, the state's economy is in the midst of an impressive recovery. Since 2006, when California's

AS ADVOCATES FOR THE ENVIRONMENT, WE HAVE LONG CHAMPIONED MARKETS BECAUSE THEY CAN DRIVE AMBITION UP

climate change programme was signed into law, the state has received more clean tech venture capital investment than all other US states combined. Bloomberg News recently ranked the Golden State the best place in the US to do business, citing the state's visionary leadership on climate change as one of the markers of its success.

California's success has attracted the interest of its North American neighbours. Québec and California have linked their carbon markets, creating North America's largest cap-and-trade system and the first example of sub-national jurisdictions in different countries launching a joint market. Ontario, Canada's most populous province

and home to a significant manufacturing base, is developing a cap-and-trade programme to launch by 2017 and link to California and Québec's market by 2018. Having the largest US state and Canadian province in a formal, linked carbon market will help lay the foundation for further carbon market collaboration in North America and beyond.

Emission trading remains a cornerstone of the EU's plans to step up its own ambition. Despite well-publicised ups and down — attributable in large part to the worst recession since the 1930s — the EU ETS is now performing well: it has overachieved its goals, leading to more reductions at lower cost than expected. The fact that allowance prices are low is a clear indicator of the low cost of emissions reductions — and an opportunity to ramp up ambition by tightening the EU's cap further, and even expanding the coverage of the ETS.

Perhaps the biggest development is in China, where in September 2015 Chinese President Xi Jinping announced plans for a national emissions trading programme by 2017. The insights gained and lessons learned from the country's seven large-scale pilots already in place will be put to use to help the world's largest emitter meet its target of peaking emissions by 2030 at the latest.

Climate progress in the US and China is changing the global dynamic. Gone are the days when the two largest emitters blame each other for inaction. And bilateral progress is inspiring commitments around the world. All told, cap-and-trade programmes are in place in over 50 jurisdictions worldwide that are home to nearly a billion people.

And more programnes are in the works. One of the most exciting opportunities is in international aviation. To meet the sector's stated commitments to carbon-neutral growth from 2020 and a 50% cut by 2050, and help drive net emissions even lower as will be needed to turn the corner to climate safety, the International Civil Aviation Organization (ICAO) is developing a market-based mechanism for consideration at its next Triennial Assembly in 2016. That would cap emissions from a global sector that accounts for roughly 2% of carbon emissions, and is growing fast — and would set a powerful precedent for international cooperation on climate change.

Another opening is in the forest sector. Tropical forests are not only crucial to stabilising the climate — they are critical to sustainable economic development for the communities and nations that rely on them. Carbon markets can play a key role in driving a new model of green growth in the tropics. By allowing jurisdictional REDD+ credits into their compliance markets, California and ICAO have the opportunity to create positive economic incentives for forest protection at a landscape scale.

TAKING THE MOMENTUM TO PARIS

Fuelled by these on-the-ground successes around the globe, markets have moved back to the centre of political discussions with a pace that has surprised even us. One of us (Fred) was at the third Conference of the Parties to the UNFCCC (COP 3), when the market mechanisms of the Kyoto Protocol were negotiated — and we were both at COP 15 when the hopes of a "global deal" evaporated in Copenhagen. For a few years afterward, market-based approaches seemed to fall off the radar in discussions of climate policy.

Now markets are back. More than 1000 businesses, nearly 100 national, state, provincial, and city governments, and over 30 NGOs signed the carbon pricing statement released at the New York Climate Leaders' Summit in September 2014. In October 2015, World Bank Group President Jim Yong Kim and IMF Managing Director Christine Lagarde launched a high-level panel on carbon pricing, including German Chancellor Angela Merkel, Chilean President Michelle Bachelet, French

CLIMATE PROGRESS IN THE US AND CHINA IS CHANGING THE GLOBAL DYNAMIC

President François Hollande, Ethiopian Prime Minister Hailemariam Desalegn, Philippines President Benigno Aquino III, Mexican President Enrique Peña Nieto, Governor Jerry Brown of California, and Mayor Eduardo Paes of Rio de Janeiro.

How can we capitalise on this political moment and build on the momentum we are seeing, to keep carbon markets growing around the globe?

The first step is a Paris agreement that provides a solid footing for markets in the post-2020 climate regime. By markets, we don't have in mind some form of centralised mechanism under UN oversight. To be sure, there are a number of Parties who would like to have such a mechanism available — and properly designed, with provisions ensuring that any credits generated by such a mechanism meet the highest standards of environmental integrity, it could have an important role to play.

But the more powerful role for markets will be in the new decentralised world that is emerging. Markets not only provide a powerful way for individual countries to meet their own commitments. Over time, as jurisdictional emissions trading systems mature and take root, international linkages can promote greater robustness and liquidity, attracting new countries into a growing global market, and driving greater ambition – as well as certainty of environmental outcome, one of the signature benefits of a mandatory declining cap.

Ideally, Paris will provide a political signal that such international cooperation will be a core part of the new regime. But it's not

A DURABLE CLIMATE REGIME WILL BE ONE THAT HARNESSES MARKET FORCES IN THE HUNT FOR SOLUTIONS

needed. As sovereigns, Parties already have all the authority they need to use markets in meeting their commitments. The UNFCCC enshrines cooperation as a central principle. And more than 70 countries have already expressed an interest in using markets as part of their Intended Nationally Determined Contributions (INDCs) submitted to the UNFCCC.

Where the Paris agreement does have a role to play is in making sure that, when markets are used, they have integrity. In particular, the Paris agreement (and the associated COP decision) should articulate clear principles — on accounting, transparency, and monitoring, reporting, and verification — that rule out "double-counting" of emissions reductions. To ensure the integrity and credibility of the climate regime, and keep the atmosphere whole, emissions reductions achieved in one country and transferred to another must only be claimed once.

Even if the Paris agreement meets this standard, however, much work will remain to lay out clear guidelines for integrity of international carbon markets. As momentum grows, coordination among jurisdictions with carbon markets will be increasingly crucial to maximising cost-effectiveness and environmental integrity – which in turn will give jurisdictions the confidence to go faster and farther in reducing emissions.

A CLUB OF CARBON MARKETS

So far, the UNFCCC process has failed to make much progress on this front, through the so-called Framework for Various Approaches discussions that have taken place since COP17 in Durban. An alternative approach may be needed — one that starts small and engages only those countries and jurisdictions that actually have an interest in implementing emission trading.

Much as the General Agreement on Tariffs and Trade (GATT) helped promote trade liberalisation by attracting broad participation in a plurilateral trade system, a voluntary coalition or "club" of carbon market jurisdictions could promote climate action by attracting broad participation in mitigation effort. Such a coalition would complement efforts under the UNFCCC, encouraging enhanced ambition by countries and allowing participation by sub-national jurisdictions as well as national and regional ones. Indeed, drawing on the similar experience of the Forest Carbon Partnership Facility, the trust and expertise gained from shared experience in a carbon markets club could lay a deeper foundation for cooperation on markets within the UNFCCC itself.

A durable climate regime will be one that harnesses market forces in the hunt for solutions, mobilises private sector energies, enhances national self-interest and, through rigorous and transparent reporting, allows countries to demonstrate to each other that they are meeting their commitment. The Paris agreement can help on each of these fronts, but the model here is an incremental one: Rather than seeking to solve climate change in one fell swoop, a successful outcome in Paris would contribute to growing momentum in the scope and effectiveness of climate action around the world, over time. A UN agreement is only one of many tools available to address climate change. It will take continuing strong action by leading emitters and leading carbon market jurisdictions to spur the technological, political and institutional transformations that will support more ambitious action in the years to come.

*Environmental Defense Fund president **Fred Krupp**, who has guided EDF for more than three decades, is a widely recognised leader of the international environmental community. He is an influential voice on climate change, energy, and sustainability issues, and an eloquent champion for harnessing the power of the marketplace to protect our environment.*

***Nathaniel Keohane** is a Vice President at Environmental Defense Fund, where he leads EDF's Global Climate programme and helps to shape the organisation's advocacy for environmentally effective and economically sound climate policy. Nat's areas of expertise include US and global climate and energy policy, the economic impact of climate change, the benefits and costs of reducing GHG emissions, and the design and performance of cap-and-trade programmes and other policy instruments.*

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COMPARISON AND LINKAGE OF HETEROGENEOUS MITIGATION SYSTEMS IN THE PARIS REGIME

With the Paris agreement set to enshrine a bottom-up framework for international climate policy for years to come, Joseph Aldy, Robert Stowe and Bianca Sylvester outline how different approaches to cutting emissions can be compared and linked

At the UN climate talks at the end of 2015, the 196 parties to the UNFCCC intend to finalise a new agreement to reduce GHG emissions[1] that will become effective in 2020 and that will be very different from the Kyoto Protocol. Most notably, mitigation effort will be voluntarily specified by the parties themselves, as they deem appropriate to their national circumstances, rather than being cast—as in Kyoto—as legally-binding, economy-wide, quantified emissions-reduction obligations. While efforts to share information and experience will continue to be valuable inputs to domestic decision-making, ultimately each government is, and will continue to, make decisions about mitigation based on what is the best fit for its specific situation.

All parties are expected to submit Intended Nationally Determined Contributions (INDCs), which must include mitigation plans, to be incorporated into the Paris Agreement, whereas only developed countries had emissions-reduction obligations under Kyoto. This "bottom-up," voluntary, pledge-based policy architecture will be characterised by highly heterogeneous mitigation commitments. Mitigation components of INDCs will vary with regard to target type (eg, peaking, intensity, or quantified, absolute emissions-reduction); level of ambition; time period over which the INDC is implemented; and policies that parties expect to use to achieve their goals, to the extent that these are specified in the respective INDCs.

This heterogeneity makes it difficult to compare INDCS and their mitigation impact, either before the Paris agreement is implemented or during implementation. Transparent comparison would be valuable; it could facilitate participation and compliance in an agreement if it could illustrate that all parties are doing their "fair share." In addition, transparent comparison through periodic reviews of INDCs and their subsequent implementation would prompt increased national mitigation ambition over time.[2]

Transparent approaches to comparing mitigation effort will also be essential to enable the transfer of "mitigation-effort units" from one UNFCCC party to another — that is, broadly speaking, to enable linkage. Linkage between and among mitigation systems is in turn likely to reduce aggregate abatement cost across the linked jurisdictions[3] and thereby promote increased ambition (separately from any review mechanisms specified in the Paris agreement); if parties can achieve more environmental benefit with equal or lower aggregate cost, there is a good chance they will try to do so.

Novel techniques for comparison are not needed when two or more jurisdictions are assessing potential linkages between or among their cap-and-trade systems (that is, for "bottom-up" linking, prompted by the jurisdictions themselves). In that case, "mitigation units" (permits, allowances)

TRANSPARENT COMPARISON COULD FACILITATE PARTICIPATION AND COMPLIANCE IN AN AGREEMENT IF IT COULD ILLUSTRATE THAT ALL PARTIES ARE DOING THEIR "FAIR SHARE"

represent the right to emit actual emissions (totalling, in aggregate, to the cap in each jurisdiction's system), and relative (market) allowance prices across the jurisdictions serve as a transparent guide to policy makers as they consider or implement a link.

The extent to which the design of the systems must be harmonised, for example, with regard to sectoral scope and ambition, is determined by the linking parties (in large part to avoid significant price discrepancies). In addition, adequate technical means must be in place to report upon and monitor emissions, which would be the case regardless of what types of systems are being linked.[4] If one party considers another party's cap to be too high (with resulting lack of environmental ambition or integrity), as captured in large part by relative prices, the first party can choose not to link.

Techniques may be available — or possible to construct — to compare disparate mitigation systems; for example, a cap-and-trade system in one country and a performance standard in another. Once such a comparison is made, it may be possible in some cases to reduce these efforts to common mitigation units, which may then be traded.[5]

Current research suggests four principles for evaluating possible metrics for comparing heterogeneous mitigation effort.

1. An ideal metric should be comprehensive, capturing the entire effort undertaken by a country to achieve its mitigation commitment.
2. A metric should focus on observable — and preferably quantifiable — characteristics of effort.
3. Individual countries or stakeholders should be able to reproduce a metric given (a) the inputs used by analysts, and (b) available public information.
4. Given the global nature of climate change, a metric should be universal, constructible by and applicable to as broad a set of countries as possible. Candidates are emission-related metrics, abatement cost, and carbon- or energy-price metrics. Each may have its advantages, disadvantages, and appropriate potential applications in a system of voluntary, heterogeneous mitigation commitments.[6]

In a heterogeneous system, it may also be necessary to more explicitly assess and compare the degree to which jurisdictions achieve environmental objectives. This has been the case for emission reduction projects under project-based emissions-reduction-credit (offset) systems, which can serve to indirectly link two or more cap-and-trade systems that choose to accept offset credits for compliance purposes. Offset systems are fundamentally different from cap-and-trade systems, in that "mitigation units", or offset credits, represent an emissions reduction from an unobservable emissions baseline, rather than the right to emit actual emissions that total to a cap. Put differently, offset projects must be shown to reduce emissions "additional" to whatever (calculated or hypothetical) reductions might have occurred in their absence.

The most prominent example of an offset system, by far, has been the Kyoto Protocol's Clean Development Mechanism (CDM). For the CDM and other project-based offset systems, a number of organisations have attempted to develop and apply techniques for assessing and rendering more transparent the environmental quality of projects, and better calibrating the value of resulting credits in compliance and voluntary markets.[7]

Somewhat analogously, a Paris regime will be characterised by highly heterogeneous mitigation systems — including many that will measure progress by comparing actual emissions to a calculated "business-as-usual" baseline or other type of counterfactual benchmark. Depending on the specific characteristics of a national mitigation system, absolute metrics (prices, abatement costs, actual emissions) may be deemed insufficient by other parties for comparison purposes and for evaluating opportunities for exchanging mitigation units. When considering linkage between such disparate systems, robust metrics that meet the aforementioned criteria are crucial for ensuring that governments and market participants have the information they need to determine the real mitigation value of the carbon assets they import, or plan to import.

Governments could choose to recognize the real mitigation value of carbon assets to avoid trading with certain systems altogether. An alternative approach is being explored by the World Bank Group's Networked Carbon Markets (NCM) initiative. It is exploring the feasibility of using mitigation value to ensure that system differences are properly accounted for and, therefore, that the environmental integrity of a stronger programme would remain even if it was linked to a weaker system. The advantage of this approach is that it allows more systems to participate in an international carbon market, while still preserving the environmental integrity of trade in carbon assets.

Other (and somewhat related) relative approaches to linkage would be to identify exchange rates for units in two or more countries or to assign discount rates to one or more units.[8] Even with credible, independent and transparent assessment processes, however, if systems are sufficiently different (for example, a technology standard and a cap-and-trade system), such identification might not

IF PARTIES CAN ACHIEVE MORE ENVIRONMENTAL BENEFIT WITH EQUAL OR LOWER AGGREGATE COST, THERE IS A GOOD CHANCE THEY WILL TRY TO DO SO

CURRENT RESEARCH SUGGESTS FOUR PRINCIPLES FOR EVALUATING POSSIBLE METRICS FOR COMPARING HETEROGENEOUS MITIGATION EFFORT

be fully possible a priori. In such cases, exchange or discount rates might need to be set through an iterative discovery process. Again, with linkage among cap-and-trade systems or between a cap-and-trade and carbon tax, such complexity would not be required. But among more divergent systems, as we will surely find in the range of INDCs submitted for inclusion in the Paris agreement, they might help enable transfers of mitigation units — or at least serving as heuristics in advancing capacity to do so.

There is a diverse "community" of jurisdictions, intergovernmental organisations, academic institutions, non-government organisations and private sector entities that are already assessing current climate-mitigation actions and those to be included in the Paris agreement. One example is Climate Transparency, a consortium of practitioners that are learning from each other and comparing notes on their approaches, methods, and assumptions — and making progress toward converging on a common conceptual framework and terminology. In the lead up to the Paris meeting, it is important that efforts such as this are encouraged, so that the new regime supports efforts to compare diverse, nationally-determined climate mitigation actions. This would enable cross-border carbon-market transactions that are required to both facilitate growing mitigation ambition and to catalyse finance for low-carbon investment.

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(1) As well as to address adaptation to climate change, climate finance, and other important dimensions of international climate policy. (2) Joseph E. Aldy and William A. Pizer, "Alternative Metrics for Comparing Domestic Climate Change Mitigation Efforts and the Emerging International Climate Policy Architecture," forthcoming in Review of Environmental Economics and Policy (2015). See also Joseph E. Aldy, "The Crucial Role of Policy Surveillance in International Climate Policy," Climatic Change 126 (3-4), p. 279–92. (3) As well as potentially reducing volatility in the price(s) of traded units. (4) The most significant current example of a purely bottom-up linkage of cap-and-trade systems is that between the US state of California and Canadian province of Québec. These two sub-national jurisdictions worked for several years to ensure that their system designs were sufficiently harmonised. The EU Emissions Trading System and the Regional Greenhouse Gas Initiative (northeastern US) are also, in fact, networks of linked cap-and-trade systems. (5) Gilbert E. Metcalf, and David Weisbach, "Linking Policies When Tastes Differ: Global Climate Policy in a Heterogeneous World," Discussion Paper 2010-38, Harvard Project on International Climate Agreements, July 2010; Daniel Bodansky, et al., "Facilitating Linkage of Heterogeneous Regional, National, and Sub-National Climate Policies through a Future International Agreement," Discussion Paper, Harvard Project on Climate Agreements, November 2014. (6) Aldy and Pizer (2015). (7) There have also been certain serious issues with regard to environmental integrity in the context of the Kyoto Protocol's International Emissions Trading system. These issues were unique to the Protocol, the importance of which is now greatly diminished, and the underlying circumstances — an emissions trading system embedded in a "top-down" international climate agreement — are unlikely to be replicated in the foreseeable future. (8) Michael Lazarus, et al., "Options for Restricted Linking: reporting on work-in-progress," presentation at research workshop, "Comparison and Linkage of Mitigation Efforts in a New Paris Regime," Harvard University, May 8, 2015.

Harvard Project on Climate Agreements

WORLD BANK GROUP Climate Change

FROM A TINY RIPPLE

The carbon market as we know it grew from several, separate initiatives around the world – which the 1997 Kyoto Protocol helped coalesce, and inspired further efforts. In an extract from IETA's forthcoming oral history, Katie Kouchakji looks at what was built with just a small amount of policy direction

For many observers, the carbon market truly began to take off in 2005, with the entry into force of the Kyoto Protocol and the start of the EU Emissions Trading System (ETS). In reality, work on market mechanisms to tackle rising GHG emissions had been ongoing since the late 1980s and really took hold after the Kyoto Protocol was agreed in 1997 – despite the rules for its flexible mechanisms not being agreed until 2001.

"The process to negotiate market mechanisms started with the mandate from COP 1 in Berlin," recalls Frank Joshua, who helped set up the flexible mechanisms when he was at the UN Conference on Trade and Development, referring to the first Conference of the Parties to the UNFCCC in 1995.

"The US had, at that point, signalled they were interested in discussing flexible mechanisms … leading up to the Kyoto conference in 1997, were a series of proposals, including one from Brazil on something called the Clean Development Fund that, at some point, became the Clean Development Mechanism [CDM]."

The road between the Kyoto Protocol being agreed and the rules for its flexible mechanisms being finalised in Marrakech in 2001 was long, as a result of lingering ill feeling after the end of the negotiations in Japan, says Joshua – which had overrun by two days.

"It was mainly the provisions on emissions trading [that held up the Kyoto talks], which had been objected to by many delegations," says Joshua. "The US insisted that they must be in and, at one point, the US delegation had threatened to walk out."

He adds: "The meeting eventually got around to fixing the question of emissions trading by deleting the paragraph on emissions trading and reinserting a paragraph at the back of the document, which is now Article 17 … which authorised emissions trading."

Dirk Forrister, now president of IETA, was negotiating for the US in 1997 in his capacity as Chairman of the White House Climate Change Task Force under President Clinton.

"The biggest challenge was trying to get global agreement on the use of markets," he says. "It was such a new thing – we had done it in the US on acid rain trading, but it was not a tool that had been used in a lot of other places, and it was one of the last things to be negotiated. It really went down to the wire."

GROWTH OF THE CDM

"The Kyoto Protocol was the first international piece of law that tried to articulate an idea of carbon rights and the trading of these carbon rights, and creating a market," says Martijn Wilder, head of Baker & McKenzie's global climate change practice, which was started following the Kyoto agreement. "Our vision was that the Kyoto Protocol, the CDM and international emissions trading really set a framework for really interactive private sector engagement in climate change."

The first CDM projects were quick off the mark, building off of previous experiences with government initiatives to reduce emissions. EcoSecurities was one such firm that translated its experiences into this emerging market and, by 2005, it had built up the largest private sector portfolio of CDM investments.

"Over time, we started recognising that the next stage of the market was going to emerge – there was going to be a real market, as opposed to companies trying to figure out a project," says Marc Stuart, one of the co-founders of EcoSecurities, of the early years.

"THE KYOTO PROTOCOL AND INTERNATIONAL EMISSIONS TRADING SET A FRAMEWORK FOR REALLY INTERACTIVE PRIVATE SECTOR ENGAGEMENT IN CLIMATE CHANGE"

– MARTIJN WILDER

"IT WAS LIKE A JUMP INTO THE UNKNOWN"

– CHRISTINE FAURE-FEDIGAN

Stuart and his business partner, Pedro Moura Costa, built the first certification system for third-party verification firm SGS in 1997, and it was this that prompted the establishment of EcoSecurities. The first project that they used this new system for was to certify the national GHG reductions of Costa Rica – before emissions accounting became standard under the Kyoto Protocol.

This work led Stuart and Moura Costa to other projects with governments and public sector institutions, before they looked to acquire their own carbon assets – often at a discount. But it paid off, and Moura Costa notes that by the time the Kyoto Protocol entered into force, the firm had the largest private sector portfolio.

"We got involved in something like 700 projects, developed and registered about 450, and about 54 technologies," he says, with the pair moving away from their initial projects in forestry as these projects were largely shut out of the Kyoto Protocol.

CARBON FUNDS: STIMULATING THE MARKET

The World Bank was also a significant player in the early years, with Ken Newcombe heading up its carbon finance unit. Its Prototype Carbon Fund (PCF) aimed to stimulate the market and show what could be done – in a similar fashion to how its current Pilot Auction Facility is showing a new model of finance for CDM projects. However, Newcombe says the greatest challenge was the fact that he worked for the Bank.

"It was both an opportunity and very difficult – some people call it being an 'intrapreneur', being an entrepreneur on the inside of a big institution," he says. "It was like making love in the time of cholera – it was, at the same time, really exciting and dangerous because you had a major proposal for change which was poorly understood and, in some quarters, unwelcome."

Newcombe says the road to the PCF began at the Rio Earth Summit in 1992, and culminated eight years later with the Fund's first close in April 2000, having raised $135 million (which rose to $180 million in later fundraising rounds) from both private sector firms and sovereigns. One of these investors included Gaz de France (GDF), now known as Engie.

Christine Faure-Fedigan, who is now the firm's director of corporate climate policy, recalls that, in 2000, it was a bit of a gamble to invest in the PCF as the firm was not yet then subject to carbon emission regulations.

"Carbon markets didn't exist, crediting projects didn't exist, we didn't know if we were going to have obligations, we didn't know anything about regulations," she says. "It was like a jump into the unknown." What swayed the decision was a sense by the board that, as GDF transformed from a gas supply company into a power generator, it would be subject to constraints in the future.

The PCF was an opportunity to "get us a better understanding of how putting a price on carbon would give us opportunities to develop new services and new products for our big consumers", says Faure-Fedigan. "Also we knew that there was going to be the possibility to use those credits against our possible future obligations."

Private sector funds followed suit, most notably Natsource's Greenhouse Gas Credit Aggregation Pool which, in 2005, raised €455 million ($498 million) at its first close – the largest in a private sector fund at the time.

"The hardest part was to get it launched," remembers Jack Cogen, then president of Natsource. "When the carbon markets first began… we had very little capital, and it was very hard for large industries to take us very seriously. We had to convince them that our intellectual property and staff was more than sufficient to make up for the capital and they should give us the money – which ultimately they did. We ended up raising about $1.2 billion at our height."

PREPARING FOR LIFE AFTER PARIS

Despite the difficulties of recent years and the near-collapse of the CDM, the private sector is keenly watching Paris for any ripple of policy that could spawn the next wave of market activity. As the past has shown, it doesn't take much to spark the innovations that the future needs – and this time, there are solid examples to draw from and build on.

"A lot of the early lessons that were learnt will be brought across," says Baker & McKenzie's Wilder – including on market

"IT WAS LIKE MAKING LOVE IN THE TIME OF CHOLERA – EXCITING AND DANGEROUS AT THE SAME TIME"

– KEN NEWCOMBE

linkage, CDM evolution, use of offsets and market design. "We've got a very solid base to work off."

"I think we'll build on the base of experience and exciting tools and existing markets," says Forrister. "We're seeing carbon markets take grounding in a lot of new places, and I think that's very healthy."

But, he adds, "It's frustrating to see the erosion of the market because the policy side, frankly, hasn't kept up with the business side … it will surprise you how creative and engaged the business community can be behind such a programme.

"We need to be taking the issue much more seriously and using this tool to its full potential. Right now, it feels like we're still revving the engines and getting ready to do something dramatic with it, but we haven't let it show its full colours yet."

Katie Kouchakji *is a freelance journalist who has covered the carbon market and climate policy since 2005. Formerly editor of Carbon Finance until 2013, Katie has also worked at Argus Media. She has worked as IETA's communications advisor since 2014 and is preparing an oral history of the carbon market for IETA, to be released in 2016. Katie has a degree in English Language and Linguistics from Durham University.*

(left) Participants on a site visit in Chile to one of the PCF's projects (right) Tombstone marking the total amount raised by Natsource's Greenhouse Gas Credit Aggregation Pool in 2005 – the world's largest private sector manager of carbon emissions assets at the time.

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