

POLICY BRIEF

LOWY INSTITUTE
FOR INTERNATIONAL POLICY

JULY 2010

FERGUS GREEN

Lawyer

Allens Arthur Robinson

WARWICK MCKIBBIN

Professorial Fellow

Lowy Institute for International
Policy

Director, ANU Research School of
Economics, and

The Brookings Institution,
Washington DC

GREG PICKER

Consultant and Honorary

Research Consultant, Institute of
Social Science Research,
University of Queensland



LOWY INSTITUTE FOR
INTERNATIONAL POLICY

31 Bligh Street

Sydney NSW 2000

Tel: +61 2 8238 9000

Fax: +61 2 8238 9005

www.lowyinstitute.org

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

WHAT IS THE PROBLEM?

Copenhagen failed to produce an agreement on climate change commensurate with the scale of the problem, highlighting the fundamental weaknesses in the existing UN framework. Progress on a new agreement is agonisingly slow, with fundamental disagreements remaining on nearly every aspect of the negotiating agenda. Weightier commitments by the major emitters are necessary, but calls for 'greater ambition' ignore the structural problems embedded in the institutions, processes and policy models of the UN climate regime.

WHAT SHOULD BE DONE?

Under a price-based international framework, countries would undertake to implement specified actions and policies. Those policies should then be converted into an internationally standardised form of economy wide 'carbon price equivalent', with each country pledging/negotiating to implement a starting carbon price equivalent policy along with a schedule of real annual price increases.

This framework would be more likely to achieve rapid emissions reductions and countries' commitments should more readily conform to the widely accepted principles of 'common but differentiated responsibilities' and 'comparable effort'. The framework could be negotiated relatively promptly among the 17 highest emitters, which meet regularly within the US-led Major Economies Forum, while negotiations over a comprehensive treaty continue within the UN.

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

‘Only a crisis — actual or perceived — produces real change. When that crisis occurs, the actions that are taken depend on the ideas that are lying around.’

— Milton Friedman¹

Introduction

After an extraordinary build-up, stratospheric public expectations, unprecedented political attention, and the presence of more than 100 heads of State, the Copenhagen Climate Change Conference spectacularly failed to produce an international response to climate change commensurate with the scale of the problem. Instead, the Conference revealed with great drama the fundamental weaknesses of the existing framework for international climate governance. Even the Copenhagen Accord – a 3-page, heavily-qualified, non-binding Statement of political intent, and the singular achievement of the Conference – was vigorously resisted by a number of countries when it was submitted to the full plenary for adoption on the final night of negotiations. As exhausted delegates lay lifeless, strewn across the cavernous negotiating hall watching Venezuelan officials block the adoption of the Accord because it made reference to the role of market mechanisms in reducing greenhouse gas emissions, even the most ardent advocate of the 20-year old UN climate process could not have helped but think ‘there must be a better way’.

In the light of Copenhagen, we believe there is. In a series of papers written between 1997 and 2009, McKibbin, Wilcoxon and later Morris systematically critiqued the policy assumptions and models embedded in the prevailing UN climate governance framework.² The object of their critique was

neither the veracity of its underlying climate science nor the desirability of its overarching goals, but rather the effectiveness of the particular policies and processes being utilised to achieve those goals. Those authors have designed, developed and advocated an alternative international policy model for cutting greenhouse gas emissions based on a system of harmonised and steadily rising prices (or shadow prices) on the emission of carbon dioxide and other greenhouse gases. The policy framework has evolved over time from a focus on a price cap to its most recent version, known as a ‘carbon price collar’.

The goal of this paper is twofold. First, to articulate clearly the reasons why a carbon price-based framework is, in the post-Copenhagen world, more likely than the existing framework to achieve rapid cuts in global emissions while building trust and confidence among the world’s major emitters. This trust will be essential for the deeper, longer-term cuts that the atmosphere needs if we are to have any chance of stabilising concentrations of carbon dioxide in the atmosphere. The second goal of the paper is to outline a suite of practical steps and institutional innovations needed to implement a carbon price-based framework quickly and embed it within a viable institutional framework.

By starting from where we are now – with the mitigation policies countries have already committed to implement, the basic principles of fairness that the majority of States have endorsed, and the international institutions that already exist – the paper seeks to demonstrate that a better international framework for cutting greenhouse gas emissions is not a

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

quixotic dream. Rather, with the small dose of political courage required to try something new, it is firmly within our grasp.

Copenhagen and the crisis of climate governance

The United Nations Framework Convention on Climate Change (UNFCCC) was negotiated in 1992, establishing a multilateral framework for international climate governance within the UN system. It has yielded worthy accomplishments, including the development of universal standards for measuring, accounting for and reporting greenhouse gas emissions from disparate sources and the cultivation of technical and administrative capacity to respond to climate change in developing countries. But since the inception of this framework, the world's nations have attempted to build on it a colossal structure that has proved elusive: a comprehensive solution to every aspect of climate change, including a regime of targets and timetables that would be sufficient to keep climate change to a safe level, that would share the burden of costly emissions cuts fairly among all major countries, and that is agreeable to all 193 States Parties. They have tried to build this structure on weak foundations – in circumstances where many countries lack credible domestic policies and institutions for mitigating climate change, distrust one another and have little confidence that others will implement their obligations. At Copenhagen, that putative structure collapsed under the weight of its own ambition.

Although genuine progress was made in the formal negotiations at Copenhagen,

fundamental disagreements remain on nearly every element of the Bali Action Plan (the blueprint for negotiating a comprehensive outcome agreed by all Parties in 2007), from the long-term targets for developed country mitigation to the permissible role of offsets in domestic emissions accounting. While many hope that a comprehensive agreement will emerge by the time of the Mexico conference later this year, few observers seriously rate the prospects of reaching such an agreement in the near term.

But the improbability of concerted international action arises not simply because countries take politically divergent positions on the suite of issues being negotiated. Rather, countries' differences are constructed and exacerbated by certain fundamental strictures of the current framework itself. Copenhagen clearly demonstrated that, contrary to conventional wisdom, those divergent positions will not converge simply through more vigorous bargaining, 'higher ambition' and 'greater momentum' from governments during the ongoing UN negotiations. More fundamental, structural changes are required.

The UN negotiations have evolved along a particular historical path: certain ideas were expounded and compromises made at various points throughout the history of the negotiations, such that particular approaches to addressing the climate problem were adopted, repeated, consolidated and ultimately embedded in the cultural fabric of the UNFCCC and its institutions. Four such strictures have most severely limited the possibilities for institutionalised international cooperation to mitigate climate change.

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

The first is the *comprehensiveness* of the UNFCCC's institutional scope. From the principles embedded in the Convention to the hype surrounding Copenhagen, UN climate negotiations have always been characterised by aspirations towards a comprehensive solution to climate change embodied in a single, unified treaty. As the climate problem has become more challenging and complex over the years, countries have piled more and more issues onto the UN negotiating agenda rather than seeking to address different issues in different forums, or to break the problem down into smaller chunks. While climate change is also addressed through other multilateral institutions, efforts to establish these have frequently been derided as 'distractions' from the UNFCCC, on which mainstream efforts have remained firmly fixed.

The second stricture is the *universal consensus* required for the Parties to the UNFCCC collectively to adopt any decision or take any action. UNFCCC membership is open to all countries (and the EU) and currently stands at 193 States Parties. As the Parties have never adopted rules of procedure, they make decisions by 'consensus' (which, in the UNFCCC, means the absence of objection by any Party, not the positive assent of all Parties). This universality of membership allows all countries to have their views and interests considered. But it effectively gives any of the 193 Parties the power to veto any decision – and block negotiations on any issue – for any reason whatsoever. This veto power is not hypothetical: its threat and use by countries to suit their national interests is commonplace. The consequence is that negotiations are exceedingly cumbersome and

produce 'lowest common denominator' decisions: hardly a desirable way to address such an urgent and far-reaching problem.

Thirdly, since the negotiation of the Kyoto Protocol (and back as far as the Berlin Mandate in 1995), *targets and timetables* has become the entrenched policy model for addressing climate change mitigation at the international level. Based on analogous policy models drawn from nuclear arms reduction treaties and the international regime to limit ozone-depleting substances, and fervently advocated by Europe and environmental NGOs, it was agreed at Kyoto that (developed) countries would be allocated emissions targets that they must reach within a given timeframe.³ The targets and timetables model has always been motivated by countries' sense of its superior capacity to ensure sufficient emissions reductions, while enabling a fair distribution of mitigation effort: a sufficient level of mitigation can be calculated and translated into a collective target, which can then be divided up into smaller targets to be allocated to countries in a manner that is fair. But negotiations proceed in a bottom-up manner by which countries pledge targets based on largely self-interested domestic and international political calculations. Copenhagen revealed again how difficult it is for countries to agree on any mitigation commitments based on the targets and timetables model, let alone commitments that are sufficient and fair.

The fourth stricture is the *binary distinction between developed and developing countries*. Under the Convention, certain industrialised and former Soviet countries are designated to be 'Annex I' countries. Those countries have

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

greater responsibilities than all other (non-Annex I) countries for the purposes of the Convention and, under the Kyoto Protocol, only Annex I countries are subject to binding mitigation obligations. This rigid distinction reflects one particular interpretation of the ‘common but differentiated responsibilities’ principle (according to which all countries have a responsibility to reduce emissions, but developed countries have greater responsibilities) – an interpretation that treats the UK the same way as the Ukraine, and China the same way as Chad. It has also helped to inculcate an antagonistic mentality between developed and developing countries within the UN climate framework. This competitive dynamic erodes trust among developed and developing countries and tends to reduce complex differences among countries to simplistic dichotomies. Ongoing efforts within the UN negotiations by developed (and some developing) countries to institute a fairer, more nuanced formula by which to ascribe differentiated mitigation burdens – one that takes into account a range of relevant factors – have foundered on the rock of historical precedent.

Attempts to develop a comprehensive solution to every aspect of climate change – including a regime of targets and timetables – that is agreeable to all 193 States have repeatedly failed to produce a sufficient and fair response to the problem. It may be tempting to think that if we just push harder and stick at it longer – a few more years, perhaps – more meaningful results will be produced within these strictures. But the latest and best climate science suggests that global emissions should peak by 2015 – 2020 at the latest – if we are to have even a reasonable chance of restraining

global average temperature rises to a stable and safe level.⁴ It behoves those who think that international political efforts should be directed solely within the current framework to explain convincingly how a comprehensive agreement is likely to emerge within this timeframe. Without such an explanation, sticking solely to the current framework would be a triumph of hope over reason.

But the problems don’t end with the struggle merely to reach a comprehensive agreement, for an agreement itself is no guarantor of sufficient mitigation. Indeed, there is little confidence among many countries and observers that an agreement based on targets, timetables and global emissions trading would ever be implemented.

The current UN approach is premised on the notion that countries can set a collective goal, oblige countries to meet that goal via binding international treaties, and enforce those commitments through international institutions. In the context of a well-governed nation-state, such an approach to policy-making is prudent: a central government has the power to define national priorities and objectives, set policies, pass laws, and allocate resources to agencies and programs. Importantly, States can also enforce laws through domestic regulatory institutions with the backing of mature judicial systems. But no such autonomous, centralised government exists at the international level, meaning attempts to establish comprehensive and coherent regulatory regimes are persistently and inevitably thwarted by States’ competitive interests.

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

In the climate context, this means that even if countries could agree on paper to a fair and sufficient allocation of mitigation targets and a deeper system of rules for carbon accounting and international trading in carbon permits, the institutions of the UNFCCC would lack the authority and administrative capacity needed to enforce strict compliance with those targets and rules. Overcoming the technical and administrative challenges associated with establishing a sufficient enforcement bureaucracy to police such a comprehensive agreement would be difficult enough, but the political challenge would surely be insurmountable; it is almost impossible to imagine all countries agreeing to such an incursion into their sovereignty in the sorts of timeframes in which climate change mitigation is required. The conditions within which such ‘thick’ forms of international cooperation could emerge are severely lacking.

Ultimately, whether we like it or not, international institutions and agreements depend for their effectiveness on the voluntary actions of States. So rather than assuming that a fair and sufficient response to climate change can be agreed in advance and centrally enforced, States should design international institutions and policies that help them overcome their self-interests and realise their collective interests.

The fact that greenhouse gas emitting goods and services are overwhelmingly supplied and consumed by private actors means that, in the case of climate change mitigation, international institutions also depend crucially on the investments of businesses and the attitudes of citizens. Spending years within the

current framework trying to produce even a half-decent international treaty brings with it a danger that the actors with the real power to take action to reduce emissions – domestic governments, businesses and ordinary citizens – will lose the stomach for climate change action altogether. Without public support for emissions cuts, business investment in a low-carbon economy and domestic policy interventions from governments, an effective response to climate change will remain a distant hope.

The UNFCCC’s pretensions toward institutional, substantive, ethical and democratic perfection in international climate policy are laudable and ought not to be abandoned. But the sheer urgency of weaning the world off carbon means we also sorely need a framework for international climate policy that provokes immediate, progressive responses from governments, businesses and citizens, while fostering the trust and cooperation among countries that will be essential for a sufficient and fair long-term mitigation effort. In our view, this framework must be built from the bottom up – outside, but in parallel with, the ongoing UN process.

The beginnings of a new approach

While the intellectual foundations of the framework we advocate were constructed years ago, the seeds of its practical manifestation were sown in Copenhagen. Notwithstanding its obvious failings, Copenhagen showed that many of the most powerful countries are determined, at the highest levels, to take serious actions to reduce emissions. Moreover, as demonstrated by the negotiation of and response to the Copenhagen

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

Accord, most countries – including all of the developed countries and the major emitting developing economies – have pledged to take actions or meet targets to reduce their domestic emissions, want greater transparency in the reporting of emissions, and have agreed on a common goal. In advocating the construction of an alternative framework from the bottom up, the Accord is not a bad foundation to build on.

But if the formal UN negotiations are akin to trying to build a grand structure without foundations, the Accord is a tentative foundation with no structure. The actions and goals currently pledged by countries under the Accord are formally inconsistent, insufficient to address the problem, and do not comport with expected rudimentary principles of fairness in the allocation of the mitigation burden. Those countries that have submitted their commitments under the Accord have simply committed to do what they were already doing anyway, or were already promising to do. Without any means for encouraging deeper commitments from countries or fairly allocating the mitigation burden, and absent the support of any institutional structures, there is little prospect of turning the Accord into something more than a central repository of States' unilateral commitments.

Despite the limitations of collective governance inherent in our decentralised international system, governments are manifestly capable of cooperating to create rudimentary institutions that establish new norms, facilitate shared learning, build trust and support domestic efforts to solve international problems. We therefore think

international institutions can play a helpful role in coordinating and supporting the climate change mitigation efforts of States. They can do so, for example, by: collecting and disseminating information that governments, firms and citizens need to make informed decisions; facilitating the negotiation of agreed norms and standards based on that information; and providing a forum in which repeated interactions among governments can build trust and sow confidence that others are implementing those agreed standards or are otherwise acting in accordance with agreed norms.

Some will inevitably fret that consigning international institutions to such 'thin' or 'secondary' roles means climate change would never properly be addressed. On the contrary, we think that an awareness of the limitations of international politics is an essential precursor to timely and effective mitigation action by States, and that a well designed, coherently coordinated and transparent system of rules and institutions could spur a virtuous cycle of effective government policies, business investments and public engagement that actually has a reasonable chance of yielding solutions to the problem of climate change – and of creating the conditions within which 'thicker' forms of international cooperation might eventually emerge.

A better framework for climate change mitigation

We think that that a price-based international framework is better suited to achieving rapid reductions in global emissions. The approach we advocate is based on the work on carbon price-based systems by McKibbin, Morris and

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

Wilcoxon, the latest version of which combines a carbon price collar with emission reduction targets.⁵ But the focus of this paper is to advocate the establishment of commitments, rules and institutional arrangements for a purely price-based system. Continuing to monitor, account for and report emissions would remain an important part of such a system, as we explain below, but countries' compliance obligations would pertain to prices, rather than quantities, of emissions. Such a focus would allow our framework to operate independently of a 'targets and timetables'-based compliance framework, negotiations on which are currently stalled within the UNFCCC. We discuss how the price-based framework could be integrated with a system of targets and timetables (if and when a new agreement on the latter is reached within the UNFCCC), including via a price collar system, in the final part of this paper.

The price-based policy framework we advocate builds upon commitments made by countries under the Copenhagen Accord, but encourages the expansion and implementation of those commitments in accordance with goals and principles that comport with those the majority of States (and all major emitters) have either explicitly endorsed or would be likely to agree to, based on their long-held positions in international climate negotiations. Crucially, our proposal also utilises international institutions that already exist, enabling it to be implemented quickly.

Below, we outline the key components of a price-based framework, and go on to explain why it would be more likely to induce mitigation commitments that share the

mitigation burden fairly among countries and that are sufficient to achieve any collective, long-term goal. We then elaborate on the practical steps and institutional innovations that would be required to initiate such a framework.

The key components of a price-based framework

- 1. A clear, long-term collective goal for climate change mitigation**
 - In the Copenhagen Accord, countries agreed to a long-term goal of limiting global average temperature increases to 2°C above pre-industrial levels. For now, this is a useful (if imperfect) working goal.
 - As scientific knowledge and projections improve, this quantitative goal should be revised (and probably also expressed in a different way to an average increase in temperature).
- 2. Commitments by the major industrialised and developing emitters to implement policies that would place a real or shadow price on carbon, which would rise each year⁶**
 - Under the Copenhagen Accord, all major developed and developing countries have pledged a hodgepodge of current policies, envisaged actions and conditionally promised targets.
 - All countries should specify the actions and policies they are unconditionally committed to implementing, in the form of a carbon price or direct regulation (not in the form of emissions reduction targets). Those countries that have implemented or are planning to

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

- implement policies that put a price on carbon – e.g. via a carbon tax, emissions trading scheme or hybrid scheme – should State explicitly the price (or price range) of carbon that they are prepared to accept within their domestic economies. Countries proposing to reduce emissions through direct regulation should State the policies they will implement (e.g. vehicle fuel efficiency standards, renewable energy portfolio standards, power station efficiency standards et cetera).
- Those prices and policies should then be converted into an internationally standardised form – carbon price equivalents – based on calculations done using a methodology such as that outlined in McKibbin, Morris and Wilcoxon (2010). Where countries are reducing emissions through direct regulation, the shadow price of carbon implied in those measures can be calculated using standard economic techniques. Designing and agreeing on those techniques would require further research, but a system based on value standardisation is not without precedent in international law: a similar technique is used in the World Trade Organisation, whereby countries convert non-tariff trade barriers into tariff equivalents, which countries can then bargain away during international trade negotiations.
 - Each country should then pledge/negotiate to implement a starting carbon price (or price equivalent) commencing in an agreed year (the sooner the better), along with a schedule of real annual price increases (e.g. four per cent per year).
- When negotiating their rising carbon price schedules, countries' commitments should conform to two basic principles of fairness: the 'common but differentiated responsibilities' principle (countries' mitigation burdens should reflect differences in the level of economic development between countries); and the 'comparable effort' principle (countries at similar levels of development should undertake similar burdens).
- 3. Rules for the regular international monitoring, reporting and verification of countries' compliance with their carbon price commitments**
 - Rules and systems should be developed: for calculating the average aggregate carbon price (or price equivalent) in an economy in any year; for the regular reporting of price data by countries; for the assessment and verification of that data at the international level; and to enable the sharing of that data among countries and with the public. This should occur annually.
 - 4. Rules for the regular, comprehensive and accurate accounting and reporting of emissions data – both by individual countries and by countries collectively**
 - Emissions data from countries is currently collected under the

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

UNFCCC. But developing countries have only limited obligations to report greenhouse gas inventories and information on mitigation policies to the UNFCCC, resulting in patchy data from some of the world's largest emitters.

- The Copenhagen Accord requires countries to submit emissions data more regularly than at present and provide for greater international oversight of emissions reports submitted by developing countries.
- Countries should agree rules that improve the accuracy, transparency and comprehensiveness of emissions monitoring and accounting, and increase the frequency of reporting, particularly among high-emitting developing countries.
- Technical assistance to help developing countries improve their emissions monitoring and reporting systems should be increased.

5. A body to synthesise comprehensive emissions data, up-to-date scientific knowledge, climate models and carbon price data, and to report regularly on countries' collective progress towards the agreed long-term goal

- The functions of the IPCC should be expanded to provide States with regular assessments of their collective progress towards the long-term goal and advice on the sufficiency of their mitigation efforts.

6. A regular process for reviewing (and, if need be, updating) existing price commitments in light of assessed

progress toward the agreed long-term goal

- The integrated information and analysis advocated above should be widely publicised and, upon publication, should form the basis of a regular review by countries of their mitigation efforts (i.e. their long-term price schedules).
- This review should take place semi-regularly, e.g. every five years.

Promoting fairness through a price-based system

In order to be acceptable to the preponderance of countries, an international climate policy must be founded on two principles of fairness that most countries have endorsed (or more accurately, on mutually agreeable interpretations of these two principles): 'common but differentiated responsibilities' as between countries of different levels of development; and 'comparability of effort' as between countries at similar levels of development.

There is currently no way of knowing whether commitments pledged under the Accord process are fair as between countries at different stages of development. This is because most developed countries have (as required under the Accord) merely submitted their conditional targets or target ranges; they have not committed internationally to taking any *policy action*. By contrast, developing countries (except the least developed countries) submitted their mitigation 'actions' (again, as required). Many developing countries are therefore committing to take serious action while developed countries are

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

still prevaricating over their mid-term targets. Unless countries' pledges are expressed in the same form, there will be no way of ensuring that developed countries will do more than developing countries.

The Accord process is also unfair among developed countries. In the Bali Action Plan, developed countries agreed to negotiate commitments that reflect 'comparability of effort' as between them, taking into account differences in their 'national circumstances' (e.g. differences in population growth projections, economic structure, factor endowments, etc.), as they did under Kyoto. The history of UNFCCC negotiations clearly shows that countries equate 'effort' with 'costs' (to their economies). In that sense, similar numerical targets – percentage emissions reductions below a specified base year to be met within a given timeframe – do not equate to comparable effort because differences in national circumstances imply different emissions growth projections over the commitment period, making compliance with a given target more or less costly for different countries. So, instead of negotiating directly to impose comparable costs, countries tend to argue about costs indirectly within a quantities-based framework (i.e. targets and timetables). For example, countries argue that their national circumstances and emissions projections justify them having relatively lower targets, or they try to negotiate base years, emissions accounting rules, and offsetting rules that lower the costs to them.⁷ Aside from compromising the integrity of the ultimate targets, this ungainly process – relying as it does on data and assumptions that are subjective, inconsistent, and often not shared with other countries – is a terribly

opaque way of trying to achieve comparable mitigation costs among countries.

In any case, attempting to achieve comparable effort by expressing commitments in terms of differentiated targets and timetables tends to fail. This is largely because the myriad uncertainties facing countries' future economic, technological, natural and political circumstances make it extremely difficult to compare in advance the level of effort required to meet a given target.⁸ For example, climatic events (such as droughts) and economic shocks (such as booms or busts), unforeseen at the time emissions projections were calculated and targets were set, can push a country's emissions trends off their projected pathway by numerous percentage points in either direction, making the costs of meeting a target much lower or higher than initially projected. Because of the potentially serious economic and political costs associated with failing to meet a given target, and the uncertainties inherent in committing to targets and timetables, these cost risks tend to discourage countries from making bold commitments.

All of this ultimately produces unfairness, because the efforts made by similarly-developed countries to reduce emissions (in terms of economic costs imposed) end up not being comparable. This is precisely what is happening under Kyoto.⁹ For example, former Soviet and Eastern European economies are well under their target reductions because their economies collapsed after 1990, and Australia got a favourable deal reflecting (it argued) the upward pressures on its business-as-usual emissions growth, allowing it to increase its emissions while benefitting from very favourable accounting rules on forestry.

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

While no system could guarantee equality of costs or effort, these fairness problems could be reduced considerably if countries were to negotiate over costs via a price-based framework, since equivalent carbon prices better approximate comparable costs than do equivalent emissions reduction targets.¹⁰ By expressing their existing commitments in a transparent, standardised form that renders them comparable – such as the ‘carbon price equivalents’ model designed by McKibbin, Wilcoxon and Morris¹¹ – countries could begin to negotiate commitments that are fair, as the relative stringency of countries’ existing commitments would become readily apparent. Unfairness – unjustifiable disparities among countries of similar levels of development and between groups of countries at different stages of development – would be exposed for all to see. This transparency would create a powerful incentive for countries to revise their commitments so as to conform to basic principles of fairness – i.e. the ‘common but differentiated responsibilities’ principle and the ‘comparable effort’ principle. As well as bringing international pressure to bear on countries perceived to be in breach of these principles, such a process would make it much easier for constituencies within countries lobbying for more ambitious policies to pressure their governments to adopt higher carbon prices and, conversely, much harder for forces opposed to ambitious action to argue a morally defensible case against higher prices.

A price-based framework would encourage all countries to undertake a minimum level of effort (i.e. impose a minimum cost on their economies) to reduce emissions and would

eliminate the need for complex offset arrangements whereby countries can meet their obligations by relying on terrestrial sinks (which are more abundant in some countries than others) or importing emissions reduction credits from overseas (though terrestrial abatement and subsidised international abatement should still be encouraged through other mechanisms).¹² Moreover, carbon price equivalence rules could (and, we think, should) be framed so that each country’s carbon price equivalent is net of any subsidies for fossil fuel industries or other greenhouse gas-emitting activities. This would discourage countries from unfairly subsidising their emissions-intensive industries and would reinforce the G20 promise to phase out fossil fuel subsidies that perversely encourage greenhouse gas emitting activities.

Promoting sufficiency of mitigation effort through a price-based system

The Copenhagen Accord posits a goal of limiting global temperature rise to 2°C above pre-industrial levels. Whether or not one agrees with the adequacy of such a goal, it is patent that the commitments pledged under the Accord – even if the upper ranges of pledged targets were fully implemented – would be staggeringly inadequate to meet it.¹³ An essential part of building on the Copenhagen Accord will involve overcoming the ‘sufficiency’ gap: the difference between the level of mitigation currently pledged and that required to meet the long-term goal.

Since no international policy or institution can *guarantee* that countries will collectively cut emissions by a sufficient amount in time to reach their long-term goal, the optimum international policy model is that which is

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

most likely to encourage increasingly ambitious mitigation actions by countries, with a view to meeting their Stated collective goal.

We think sufficiency in mitigation effort could best be encouraged through a framework within which countries turn their agreed carbon price equivalents into a system of rising carbon prices (a starting price for carbon commencing in an agreed year, along with a schedule of real increases on that price), combined with a rigorous assessment of emissions trends and regular advice to governments on their progress towards the long-term goal.¹⁴ A price-based framework with these features for assessing and reporting compliance is well suited to inducing compliance among countries and is therefore much more likely to result in actual emissions reductions than a quantities-based approach such as the current targets and timetables model.

One reason that climate change mitigation has proven so challenging is that it possesses qualities resembling both a global ‘tragedy of the commons’ and a ‘prisoner’s dilemma’; greenhouse gas pollution by one country affects all countries, and no country reaps the benefits of its actions to minimise pollution unless countries collectively reduce their pollution by a sufficient amount. Rules and institutions can be fashioned to overcome such problems, but without a credible enforcement mechanism, countries have an incentive to ‘cheat’ or ‘free-ride’ on the actions of others. A climate change regime that ignores this dynamic and glosses over the enforcement question is doomed to fail.¹⁵

One strategy to overcome such compliance problems is to utilise institutions involving a relatively small number of participants, ensure that compliance with agreed rules can be monitored transparently and regularly, and make information about countries’ compliance available to all other participants, thereby allowing free-riders to be identified and sanctioned by the other participants.¹⁶ A related strategy used to overcome prisoners’ dilemmas in other international negotiations is to encourage cooperation through repeated interaction, allowing countries to build trust through taking a series of small steps whereby each step is conditional on others having taken the previous step.¹⁷

The ‘all or nothing’ character of a targets and timetables system, the long timeframes involved in the compliance period, and the complexity and opacity of the data (on emission and sinks) and rules used to determine compliance mean that such a system is ill-suited to fostering cooperation to mitigate climate change. No-one can know whether a country will meet its target until the end of the commitment period, which typically occurs over many years and long after the commitments are set. This makes it very hard for participants in the system (i.e. countries) to know whether others will fulfil their obligations, leaving countries with little confidence that others are complying and instead giving them an incentive to cheat or free-ride in the short term.

By contrast, it is much easier to monitor compliance with a pre-agreed carbon price (or a carbon price equivalent of direct regulation). A government’s adherence to a carbon pricing policy can be analysed virtually in real-time,

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

meaning firms and NGOs within a country can easily monitor their government's compliance with its international obligations and pressure it to comply if it falls out of line. The mere threat of such pressure can provide a powerful disincentive for countries to cheat. A system of monitoring and compliance verification at the international level, involving regular (e.g. annual) assessments of countries' compliance with their agreed price commitments based on agreed rules would also enable countries to monitor one another's compliance regularly. The knowledge, regularly affirmed through repeated interaction, that others are complying should foster trust and encourage reciprocal compliance – a gradual increase in mitigation efforts in accordance with the agreed schedule of rising commitments.

Finally, a system that encouraged widespread compliance with a gradually rising carbon price would effectively encourage business investment in low-carbon infrastructure and technologies while making it harder for rent-seekers to lobby for government protection on trade competitiveness grounds. Further research and negotiation would inevitably be required to work out how to address competitiveness concerns arising from the likelihood that some countries will impose carbon prices, or direct regulation, on different sectors of the economy to other countries. The idea of an economy-wide price equivalent would mean that to get the same economy-wide price, a price in a particular sector would have to be much higher than a price that was more evenly spread across sectors. The resulting price disparities would create internal political pressure to spread the carbon price rises more evenly across sectors of the economy.

Institutions

If the Copenhagen Accord is to be turned into a fair and sufficient process for mitigating climate change along the lines outlined in the previous sections, it will require the support of a number of enduring international institutions. For reasons of administrative efficiency and timeliness, we advocate using existing institutions as far as possible to carry out the functions required to support the policy model we have advocated. Where an institution is not currently equipped or mandated to perform a function for which it is otherwise appropriate, we advocate the expansion or reform of that institution.

A negotiating forum for carbon price commitments and supporting rules

Initially, countries will require a forum within which to negotiate the carbon price commitments they are prepared to implement (e.g. based on their Accord commitments initially, and eventually with schedules for price increases). In order to carry out these negotiations transparently, rules will need to be developed and agreed for calculating a unit of carbon price equivalent. For example, rules would need to clarify: which sorts of pricing policies would count towards a country's carbon price equivalent and which would not; how prices applicable to different economic sectors would be treated; whether fossil fuel/carbon-intensive subsidies would be netted out; and how the carbon price equivalence of direct regulation would be calculated.

No international institutions currently undertake these functions. However, the Major Economies Forum (MEF) has a suitable

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

mandate, the right mix of participants and the capacity to negotiate agreements. The 17 MEF members, which together account for some 80 per cent of the world's greenhouse gas emissions, could practically solve the mitigation problem on their own. The fact that non-MEF members would not need to negotiate price commitments would be of little concern to its members, as their concerns about loss of competitiveness resulting from the imposition of carbon costs are confined largely to other countries within that group. To the extent these concerns pertain to countries outside the MEF, it is likely that many such countries (e.g. New Zealand, ASEAN, Norway and perhaps some Gulf States) would follow the MEF's lead. Agreeing on the rules may require an expansion of the secretariat, and possibly the assistance of an independent organisation with appropriate technical capacity (e.g. the World Resources Institute) to work up draft rules and calculations from which countries could negotiate.

Monitoring, reporting, verification, compliance and publicity of information

In addition to the rules for calculating price equivalents, countries will need to develop and agree on rules for the international reporting (and, possibly, shadow reporting) of carbon price equivalence data (e.g. covering the sort of price and policy data that countries must submit and the regularity of those submissions) and for verifying countries' annual compliance with their schedule of price commitments (e.g. rules for determining the extent to which committed carbon prices were implemented over a given timeframe). Raw data and compliance assessments should be transparent and made readily available to the

public through publication on the UNFCCC and MEF websites.

No institution currently undertakes these functions, but the UNFCCC already carries out similar tasks and has an appropriate mandate and technical capacity. Rules for reporting and verification could be developed through UNFCCC negotiations led by the Subsidiary Body for Scientific and Technological Advice (SBSTA), pursuant to a Conference of the Parties (COP) decision requesting an SBSTA work program to develop such rules. The proposal should initially be developed in the MEF (i.e. by the countries who will be accepting carbon price commitments) and requested by MEF countries within the COP. The MEF countries should offer to finance the technical workshops and processes associated with the work program. The UNFCCC currently undertakes monitoring, reporting, verification and compliance functions in relation to countries' emissions inventories and targets and it would be relatively simple, in a procedural sense, to expand the mandate of the Secretariat and of the Subsidiary Body on Implementation to perform those functions in respect of price commitments, in accordance with the rules we propose be developed through SBSTA.

Rules for more regular, transparent and comprehensive accounting, reporting and verification of carbon emissions and sinks within countries – particularly developed countries and high-emitting developing countries – are currently being developed and improved through the UNFCCC. This should remain a priority and appropriate decisions should be adopted irrespective of agreement

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

on the full package of issues on the post-2012 agenda.

The publication of emissions data from sources other than countries' emissions inventories is currently undertaken by the UNFCCC. This effort should also continue to be supported and improved, with a view to building a comprehensive picture of global emissions sources, sinks and trends within a single, legitimate institution.

Technical assistance to developing countries to improve emissions accounting and reporting

Financial and technical (e.g. capacity building) assistance to developing countries to assist them to implement carbon monitoring and accounting systems and prepare domestic and international emissions inventories and reports is currently provided through the UNFCCC and the Global Environmental Facility (and through various bilateral partnerships).¹⁸ This support should be expanded, with a focus on high-emitting developing countries.

Synthesis and policy advisory body

An expert body to analyse and synthesise emissions data and scientific knowledge, and to assess countries' progress towards their Stated long-term emissions-reduction goal on a regular basis will be required in order to evaluate the sufficiency of countries' carbon pricing levels and inform negotiations on future carbon price and policy decisions. This body should also identify gaps in emissions data (e.g. in international zones and through top-down measurement projects) and scientific knowledge.

These functions are currently partly performed by the IPCC, which assesses scientific knowledge and emissions data and provides policy-relevant analysis to policy-makers. The IPCC has been constrained in its ability to provide policy-relevant advice because the definition of a 'dangerous' anthropogenic interference with the climate system was deemed to be a political question on which the IPCC could not advise. Now that countries have agreed on a 2°C goal, however, it would be perfectly acceptable for the IPCC to advise countries on the sufficiency of their collective efforts to reach that goal. A COP decision is required to mandate the IPCC to expand the scope of its assessment reports to encompass this latter function. It could be included within a broader package of reforms to the IPCC aimed at improving its professionalism and capacity, bolstering the integrity of its assessment process, and increasing the frequency of its reports (e.g. to every five years). Again, a COP decision along these lines could be proposed jointly by the MEF countries.

The international policy framework we advocate could therefore be established relatively easily, with the MEF serving as the diplomatic incubator of these ideas and the forum for initial negotiations on carbon price commitments and associated rules throughout 2010. This process would need to be driven by the United States with the support of a core group of States that are genuinely interested in mitigation action and carbon pricing. That group should aim to expand as other States are convinced to join in.

The MEF countries could then take a series of proposals to the COP at the Cancún

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

Conference scheduled to begin in late November this year. The COP16 outcome should include a decision: requesting a SBSTA work program to develop the rules for monitoring, reporting and verification (MRV) of price commitments; to expand the regularity and comprehensiveness of emissions reporting; to increase assistance for emissions monitoring and reporting in developing countries; and mandating the expanded role of the IPCC. The carbon price MRV rules would be developed through SBSTA in 2011, as countries finalise their price commitments through the MEF, and adopted ahead of a price commitment compliance period beginning 1 January 2012.

Compatibility with other efforts

An advantage of the system we advocate is that it is compatible with most other efforts to address climate change. If this approach is adopted, great care will need to be taken to assure other countries that it is not a replacement for the UNFCCC or an attempt to undermine it. While negotiations over price commitments would be the focus within the MEF, developed countries should unambiguously reaffirm their intention to continue discussions over targets in the context of the ongoing UNFCCC negotiations; discussions in one should not affect the other. Failure to make this commitment clear would risk further eroding trust between developed and developing countries at a time when the international negotiations can ill afford it. The price-based system should be framed as an interim measure so that coordinated mitigation can commence quickly, in a way that balances costs fairly between countries and produces real mitigation benefits in the short term while

a comprehensive agreement is still being negotiated.

In any case, our price-based framework is broadly compatible with a ‘targets and timetables’ model of mitigation, assuming countries continue to pursue the latter through the UNFCCC. There are various ways in which a price-based system and a target-based system could interact. Most simply, countries could be bound by two separate regimes, one of which imposes a minimum carbon price equivalent and the other a carbon reduction target. A more holistic approach is the most recent version of the McKibbin, Morris and Wilcoxon price collar, whereby countries would adopt medium-term (e.g. five-yearly or ten-yearly) emissions targets in parallel with rising price collars, demonstrating compliance through the achievement of either: (i) both the target and the price floor; or (ii) the price ceiling only, if the target is overshoot.¹⁹ Alternatively, countries could adopt long-term (e.g. 2050) mitigation targets and adjust their rising price collars as needed to ensure they meet their long-term targets.

There is no great sense in fixing the interaction between a price and target based system now, given how far away a deal on targets appears to be and given that countries have not yet started negotiating on a price-based model. In the near term, simply reaching agreement on carbon price equivalents would be a great achievement which, if implemented successfully, should help build the foundations at the international level (trust and confidence among countries) and at the domestic level (structural change and institutional development) that will be necessary if an effective regime based on long-term targets and timetables is ever to emerge.

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

Harmonised carbon pricing would be compatible with, and would encourage, other international mitigation efforts. Whereas under a pure targets and timetables approach the mitigation efforts of firms, governments and other institutions merely lower the price of carbon, under a price-based system complementary mitigation efforts increase the overall level of mitigation. Multilateral funds to encourage research, development and deployment of low-carbon technologies; international finance and policies to encourage terrestrial carbon storage, e.g. through soil management, land-use and forestry; expanded policies and institutions for curbing avoided deforestation; and measures to scale down synthetic greenhouse gases and abate the pollution of black carbon could all be pursued vigorously through other international fora. Setting rules for calculating carbon price equivalents that take into account (i.e. by netting out) fossil fuel subsidies would greatly support ongoing efforts through the G20 to phase out such perverse subsidies, which would alone reduce greenhouse gas emissions by more than 10 per cent below business-as-usual levels by 2050 while producing a net economic windfall.²⁰

A system of nationally-differentiated carbon price commitments is not, however, consistent with a system of international emissions trading such as the Kyoto flexibility mechanisms. One of the primary rationales of such mechanisms is cost containment, but this would not be an issue in a price-based framework as countries would know in advance the costs to which they would be committing. Moreover, a price-based framework would avoid the potential ‘loophole’ allowing countries to purchase ‘hot

air’ emissions from others that have achieved their target without incurring any costs, such as may occur under Kyoto.

A price-based framework is also broadly incompatible with the establishment of an interlinked system of carbon markets. Though a system of linked national carbon markets would in theory be the most efficient way of reducing emissions by ensuring abatement occurs where its cost is lowest, it would be extremely challenging to implement and enforce, would be highly vulnerable to regulatory/institutional failures in any one country and to global economic shocks, and would inevitably produce volatile carbon prices that would scare away investment in low-carbon infrastructure.²¹ These vices would most likely obliterate any perceived efficiency benefits to be gained from such an ambitious edifice. In contrast, a price-based framework of transparent, gradually-rising carbon prices would imbue countries’ domestic policies with a degree of predictability and certainty, rendering them far more likely to induce transformative business investments than a system of pure targets and timetables with or without nationally-linked carbon trading markets.²² To the extent that countries adopt similar carbon prices, the overall cost of achieving a particular level of emissions reduction declines. And concerns within countries about economic competitiveness arising from differential prices would provide an incentive for prices to converge in the longer-term.²³

Finally, the framework we advocate is also consistent with efforts to address the other aspects of climate change policy, such as adaptation and financial transfers to the

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

developing world.²⁴ We acknowledge that eschewing international emissions trading would preclude the cross-border transfer of mitigation finance via the market mechanism itself. However, countries could (and should) facilitate predictable and substantial financial transfers, technology transfers, and adaptation cooperation through other means consistently with, albeit separately from, a price-based mitigation model.

If nothing else, the promise of a comprehensive international carbon market seems, in the light of Copenhagen, such a distant one that it would be unwise to forego the opportunities for near-term mitigation associated with a price-based framework. If Copenhagen taught us anything, it is that it is surely better to start building sturdy foundations rather than hoping for grand structures. This paper has shown that such foundations, if built carefully, could support an international policy framework that States ultimately find more useful than the fancier one they have long coveted.

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

References

- Allison I. et al (2009) *The Copenhagen diagnosis: Updating the world on the latest climate science.*
- Anderson K. and W. McKibbin (2000) 'Reducing Coal Subsidies and Trade Barriers: Their Contribution to Greenhouse Gas Abatement', *Environment and Development Economics*, vol 5, no 4. pp 457-481.
- Australian Government (2009), *Economic cost as an indicator for comparable effort: Submission to the AWG-KP and AWG-LCA.*
- Axelrod R. (1980) *The evolution of cooperation.*
- Axelrod R. and Keohane R. (1985) Achieving cooperation under anarchy: Strategies and institutions, *World Politics*, vol.38, iss.1.
- Barrett S. (2003) *Environment & Statecraft: The strategy of environmental treaty-making.*
- Black S., 'Australia's Kyoto target is a croc', *Crikey*, 12 March 2008: <http://www.crikey.com.au/2008/03/12/australias-kyoto-target-is-a-croc/>
- Copenhagen Climate Congress (2009) *Climate change: Global risks, challenges and decisions – synthesis report.*
- Ellis J. (2010) *The effects of fossil-fuel subsidy reform: A review of modelling and empirical studies*, Global Subsidies Initiative.
- Freidman M. (1982) *Capitalism and Freedom.*
- G20 (2009), *Leaders' Statement: The Pittsburgh Summit, 25-25 September 2009:* <http://www.pittsburghsummit.gov/mediacenter/129639.htm>
- Hotelling H. (1931) 'The Economics of Exhaustible Resources', *Journal of Political Economy*, Vol. 39, pp137-175.
- Keohane R. and Victor D. (2010) *The regime complex for climate change*, Harvard Project on International Climate Agreements Discussion Paper No. 10-33.
- Levin K. and Bradley R. (2010), *Comparability of Annex I emission reduction pledges*, World Resources Institute Working Paper.
- McKibbin W. (2009) 'A New Climate Strategy Beyond 2012: Lessons from Monetary History', 2007 Shann Memorial Lecture, Lowy Institute Issues Brief.
- McKibbin W. (2005) 'Sensible Climate Policy', *Issues Brief*, February, The Lowy Institute for International Policy, Sydney.
- McKibbin W. (2000) 'Moving Beyond Kyoto' *Brookings Policy Brief* No.66, The Brookings Institution, Washington DC.
- McKibbin W. Morris A. and Wilcoxon P. (2010) 'Comparing Climate Commitments: A model Based Analysis of the Copenhagen Accord', The Brookings Institution.
- McKibbin W. Morris A. and Wilcoxon P. (2009) 'Achieving Comparable Effort through Carbon Price Agreements', Policy Brief,

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING
THE FRAMEWORK FOR CUTTING EMISSIONS

Harvard Project on International Climate Agreements, Belfer Center for Science and International Affairs, Harvard University.

McKibbin W.J. and Wilcoxon P. (2008) *Building on Kyoto: Towards a Realistic Global Climate Change Agreement*, The Brookings Institution, June.

McKibbin W. and Wilcoxon P. (2007) 'A Credible Foundation for Long Term International Cooperation on Climate Change' in Joseph Aldy and Robert Stavins (eds), *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World*, Cambridge University Press, pp185-208.

McKibbin W.J and Wilcoxon P.J. (2002a) *Climate Change Policy after Kyoto: A Blueprint for a Realistic Approach*, Brookings Institution.

McKibbin W. and Wilcoxon P. (2002b) 'The Role of Economics in Climate Change Policy', *Journal of Economic Perspectives*, vol 16, no 2, pp107-129.

McKibbin W. and Wilcoxon P. (1997) 'A Better Way to Slow Global Climate Change', *Brookings Policy Brief* No.17, June, The Brookings Institution, Washington D.C. .

Ostrom E. (1990) *Governing the commons: The evolution of institutions for collective action*.

Prins G. and Rayner S. (2007), 'The Wrong Trousers: Radically Rethinking Climate Policy'.

Project Catalyst (2010) *Taking stock – the emission levels implied by the pledges to the Copenhagen Accord*.

Victor D. (2001) *The collapse of the Kyoto Protocol*.

Wong P., Minister for Climate Change and Water (2009) *Building confidence toward an effective global climate change agreement – an Australian perspective*, Address to the Peace Institute, New York, 27 March 2009.

¹ Friedman (1982).

² See for example McKibbin and Wilcoxon (1997, 2002a, 2002b).

³ See Prins and Rayner (2007).

⁴ Copenhagen Climate Congress (2009); Allison et al (2009).

⁵ See McKibbin, Morris and Wilcoxon (2009).

⁶ McKibbin, Morris and Wilcoxon (2009).

⁷ Though not the only culprit, Australia is perhaps the example *par excellence*, having proven more adept at pleading its special circumstances than any other country: see, e.g., Black (2009); Australian Government (2009); Wong (2009).

⁸ McKibbin, Morris and Wilcoxon (2009); and McKibbin, Morris and Wilcoxon (2010).

⁹ See generally Prins and Rayner (2007); and Victor (2001).

¹⁰ McKibbin, Morris and Wilcoxon (2010).

¹¹ This concept was first introduced by McKibbin, Morris and Wilcoxon (2010) drawing on the price approach in McKibbin and Wilcoxon (2002a).

¹² McKibbin and Wilcoxon incorporate a mechanism in their hybrid scheme whereby national sinks can be used to generate short term permits to keep the carbon price within the price collar but are not permitted to reduce the price below the short term fixed price in their model or above the lower price in the price collar.

¹³ Levin and Bradley (2010); Project Catalyst (2010).

CONFRONTING THE CRISIS OF INTERNATIONAL CLIMATE POLICY: RETHINKING THE FRAMEWORK FOR CUTTING EMISSIONS

¹⁴ The literature on pricing exhaustible resources commencing with Hotelling (1931) argues a price rising at the real rate of interest maximises the value of the scarce resource over its extraction lifetime. Carbon emissions can be equated to a scarce resource once a carbon constraint is imposed globally and this classic result can be applied.

¹⁵ See especially Barrett (2003). Barrett argues that the main reason the Kyoto agreement will fail is that negotiators dealt with enforcement as an afterthought rather than making an effective enforcement regime central to the design of the Protocol, at 360-362.

¹⁶ Pioneering work that identified the effective use of such strategies and institutions by communities to manage common resources is documented by Elinor Ostrom (1990). See also Axelrod (1984). This approach was followed in ensuring compliance with the Montreal Protocol.

¹⁷ Axelrod and Keohane (1985); Keohane and Victor (2010).

¹⁸ Existing bilateral partnerships of this nature include those between the US and China, and Australia's forest partnerships with PNG and Indonesia under its International Forest Carbon Initiative.

¹⁹ See McKibbin, Morris and Wilcoxon (2009).

²⁰ G20 (2009); Ellis (2010); Anderson and McKibbin (2000).

²¹ These problems with global carbon markets are discussed more fully in McKibbin and Wilcoxon (2002a, 2008) and McKibbin (2009).

²² McKibbin, Morris and Wilcoxon (2009).

²³ McKibbin, Morris and Wilcoxon (2009).

²⁴ McKibbin and Wilcoxon (2007).

LOWY INSTITUTE

FOR INTERNATIONAL POLICY

WWW.LOWYINSTITUTE.ORG