Post-Durban Climate Policy Architecture Based on Linkage of Cap-and-Trade Systems

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Matthew Ranson* and Robert N. Stavins†

Abstract

The outcome of the December 2011 United Nations climate negotiations in Durban, South Africa, provides an important new opportunity to move toward an international climate policy architecture that is capable of delivering broad international participation and significant global CO₂ emissions reductions at reasonable cost. We evaluate one important component of potential climate policy architecture for the post-Durban era: links among independent tradable permit systems for greenhouse gases. Because linkage reduces the cost of achieving given targets, there is tremendous pressure to link existing and planned cap-and-trade systems, and in fact, a number of links already or will soon exist. We draw on recent political and economic experience with linkage to evaluate potential roles that linkage may play in post-Durban international climate policy, both in a near-term, de facto architecture of indirect links between regional, national, and sub-national cap-and-trade systems, and in a longer-term, more comprehensive bottom-up architecture of direct links. Although linkage will certainly help to reduce long-term abatement costs, it may also serve as an effective mechanism for building institutional and political structure to support a future climate agreement.

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† Albert Pratt Professor of Business and Government at the John F. Kennedy School of Government, Harvard University, University Fellow of Resources for the Future, and Research Associate of the National Bureau of Economic Research. Section II of the paper draws upon Jaffe, Ranson, and Stavins (2009), while Section IV draws—in part—upon Aldy and Stavins (Cambridge 2009). We are grateful for comments we received from Blair Beasley, Dallas Burtraw, Denny Ellerman, Robert Hahn, Sheila Olmstead, William Pizer, Robert Stowe, Tom Tietenberg, and participants in the Conference on Climate Change Justice held at The University of Chicago Law School. The authors are responsible for all remaining errors.
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I. INTRODUCTION

Twenty years ago, with the signing of the 1992 United Nations Framework Convention on Climate Change (UNFCCC) in Rio de Janeiro, the nations of the world agreed to launch a process aimed at taking action against the risks posed by global climate change. Some limited progress has been made toward that goal: cap-and-trade systems for greenhouse gases are in place or under development in the European Union (EU), Switzerland, Australia, New Zealand, South Korea, Mexico, California, the northeastern United States, and several Canadian provinces; Japan and several Chinese cities and provinces are considering implementing such systems; and a global emission reduction credit scheme—the Clean Development Mechanism—has an important constituency in the world’s developing countries. However, despite these initial steps, international negotiations have not achieved their central objective: developing a climate policy architecture that is capable of delivering broad international participation and significant global CO₂ emissions reductions at reasonable cost.¹

The recent UNFCCC talks held in Durban, South Africa, in 2011, provide an important opportunity to frame a new approach to this exceptionally difficult global commons problem. A key product of the Durban negotiations is the “Durban Platform for Enhanced Action,” a non-binding agreement that calls for a new climate treaty to be reached by 2015 that brings all countries under the same legal regime by 2020.² Because this agreement departs from the long-standing UNFCCC division of the world’s countries into those with serious emissions-reduction responsibilities (the Annex I countries) and those with no responsibilities whatsoever, it opens up the negotiation process to new thinking about international climate policy architecture.

In this Article, we evaluate one important component of international architecture for the post-Durban era: links among regional, national, and sub-national tradable permit systems for greenhouse gases. Because linkage allows emitters in high-cost cap-and-trade systems to meet their compliance obligations by purchasing allowances or credits from systems with lower marginal abatement costs, it reduces the overall cost of achieving a given global emissions target.³ Due to this reduction in aggregate costs, there is tremendous interest—

¹ See generally Eric A. Posner and David Weisbach, Climate Change Justice (Princeton 2010).
³ See Judson Jaffe and Robert N. Stavins, Linkage of Tradable Permit Systems in International Climate Policy Architecture, in Joseph E. Aldy and Robert N. Stavins, eds, Post-Kyoto International Climate Policy: Implementing Architectures for Agreement 119, 129 (Cambridge 2010). As Metcalf and Weisbach explain, international links can also be established among national policies (such as carbon taxes, performance standards, and technology standards) that do not involve direct trading of emissions.
indeed pressure—to link existing and planned cap-and-trade systems, and in fact, a number of links already or will soon exist.

Based on recent political and economic experience with linkage between tradable permit systems, we draw several preliminary conclusions about the near-term and long-term roles that linkage may play in post-Durban climate policy architecture. Because the outline of a decentralized system of direct and indirect linkages is already emerging, it is possible that in the absence of a top-down international agreement, such a collection of linkages will become the de facto near-term architecture for post-Durban international climate policy. Such a system has considerable promise for improving market stability while a broader international climate agreement is being negotiated. However, because direct linkages are currently planned only between systems in highly developed nations, and because most cap-and-trade systems have placed limits on the use of emissions reduction credits (which allow access to inexpensive abatement opportunities in developing countries), the near-term cost savings from this ad hoc system of links may be modest. Nonetheless, this system of linkages could still play an important near-term role by providing the institutional and political foundation for a future climate architecture. Additionally, in the longer term, linkage could provide substantial cost savings while serving as either the decentralized framework for an organic, bottom-up architecture, or as a component of a larger top-down climate architecture.

The remainder of this article is organized as follows. Section II reviews the basic economic theory of linkage between tradable permit systems. Section III describes existing and proposed links among the world’s cap-and-trade systems. Section IV discusses the Durban Platform and its implications for future linkage, and Section V assesses how linkage may contribute to future climate policy architecture. Finally, Section VI concludes.

allowances or credits. See Gilbert Metcalf and David Weisbach, Linking Policies When Tastes Differ: Global Climate Policy in a Heterogeneous World, 6 Rev Envir Econ & Poly 110, 122, 124 (2012). However, as Metcalf and Weisbach and Hahn and Stavins argue, such non-trading links are more challenging; and current political and business interest focuses mainly on linking tradable permit systems. See Metcalf and Weisbach, Linking Policies When Tastes Differ at 123; Robert W. Hahn and Robert N. Stavins, What Has the Kyoto Protocol Wrought? The Real Architecture of International Tradable Permit Markets 18 (AEI 1999). Therefore, our exclusive focus in this paper is on linkage among trading instruments in the wake of the Durban Platform.
II. THEORY OF LINKAGE

We begin by describing different types of international linkages and explaining how these can affect policy considerations such as cost effectiveness, distribution of cost burdens, and national sovereignty and control.4

A. Types of Linkage

The economic and environmental effects of linking different systems depend on the form of the link. One key distinction is between direct and indirect linkage.5

1. Direct linkage

Direct linkage between two systems occurs when one or both systems allow regulated entities to meet their compliance obligations by surrendering allowances or credits obtained from the other system. These direct links can be two-way (bilateral or multilateral) or one-way (unilateral).

Two-way direct linkage occurs when two cap-and-trade systems choose to recognize each other's allowances. Because of the arbitrage opportunity posed by different allowance prices, regulated entities in the system with the higher allowance price will purchase allowances from the lower-price system. As a result, emissions in the higher-price system will increase, but emissions from the lower-price system will decrease by the same amount. This flow of allowances will cause allowance prices to increase in the lower-price system and to decrease in the higher-price system until, in principle, they converge to a common intermediate price.

One-way direct linkage occurs when a cap-and-trade (CAT) system recognizes credits from an emissions-reduction-credit (ERC) system6 or from another CAT system. In the former case, if the price of allowances is higher than the price of credits, then regulated entities in the CAT system have an incentive to purchase credits. This will increase the price of credits and reduce the price of allowances, leading prices in the two systems to converge. However, if the initial allowance price is lower than the credit price, then CAT participants will not have any reason to purchase credits, and the one-way link will have no effect on

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5 Id at 795–96.

6 An ERC system awards saleable credits to firms that implement voluntary projects that reduce greenhouse gas emissions relative to what emissions would have been under a counterfactual business-as-usual scenario. A prominent example of an ERC system is the Clean Development Mechanism, described in Section III.
prices or the distribution of emissions. Thus, a one-way link between a cap-and-trade system and a credit system ensures that the CAT system’s allowance price never exceeds the price of credits.

One-way direct linkage can also occur when one CAT system recognizes allowances from a different CAT system. As in the case described above, this type of one-way linkage ensures that allowance prices in the first CAT system never exceed allowance prices in the CAT system whose allowances it recognizes.

Governments may place limits on inter-system trading that prevent full convergence of allowance prices. For example, a government may limit the quantity of external allowances that can be used to demonstrate compliance in its own system. Alternatively, an “exchange rate” may be applied to the price of allowances or credits from other systems. Such a requirement might be used to reduce inter-system trading or to ensure that trading with other systems leads to a net reduction in emissions.

2. Indirect linkages

Indirect linkages occur when two systems link directly to a common third system. Even though neither system directly links to the other, the indirect linkage created by trading with the common system allows differences in the supply and demand for allowances to propagate between the original two systems.

An important type of indirect linkage occurs when two cap-and-trade systems both create direct one-way links to the same ERC system. As a result of these links, entities in the two CAT systems will compete for the ERC system’s credits. If the price of credits is lower than the price of allowances in both systems, then this indirect linkage can lead prices in all three systems to converge. As a result, developments in the market in one of the CAT systems can affect the allowance price and emissions level in the other CAT system.

A series of bilateral (two-way) linkages between several CAT systems will also result in indirect linkage. Such a system will have the same effects as direct multilateral linkage among all of the systems. For example, if System A has a two-way link with System B, which has a two-way link with System C, then trading will—again, in principle—lead allowance prices to converge across all three systems, despite the fact that A and C are not directly linked.

B. Implications of Linking

Linkage can affect overall cost-effectiveness, the distribution of economic impacts, national control over policy design, and the incentives that nations face in setting domestic emissions reduction targets. Each of these factors has
implications for the role that linkage may play in a post-Durban international policy architecture.\(^7\)

1. Cost effectiveness

The most important benefit of linkage is to lower the aggregate costs of emissions reductions by allowing firms in high-cost systems to pay for less expensive abatement opportunities in lower-cost systems. The improvement in cost-effectiveness will be greatest when the two systems face very different marginal abatement costs. Furthermore, by enlarging the scope of the relevant market, linking can improve market liquidity, reduce volatility in prices, and lessen concerns about market power.

However, linkage can also have detrimental effects on the effectiveness of domestic climate policies. A key concern is the problem of “additionality”: whether purchasing credits from an emissions-reduction-credit system truly reduces overall emissions.\(^8\) This problem arises from the difficulty of defining a counterfactual baseline against which to measure the effects of projects intended to reduce greenhouse gas (GHG) emissions. If linkage allows regulated firms in a cap-and-trade system to purchase ERC credits from emissions reduction projects that would have occurred anyway, then linkage may actually cause aggregate emissions to increase (or to decrease less than they otherwise would have).

2. Distribution of policy impacts

Linkage can also change the distributional impacts of GHG policies on regulated firms and the consumers that they serve. Whether a firm benefits or suffers from a new link depends on: (1) whether the firm is a net seller or net buyer of allowances, and (2) whether the firm is located in the higher- or lower-price system. For example, after a link to a system with a higher price, net sellers in the lower-price system will benefit from the opportunity to sell more allowances, and to sell them at the higher post-linkage price. However, net buyers in the lower-price system will have to pay a higher price after linking, making them worse off. Thus, although linkage improves aggregate welfare in both systems, it can also create individual winners and losers in both systems.

The distributional effects of linkage also depend on the type of systems that are linked. For example, the creation of a one-way link between a cap-and-trade system and an emissions-reduction-credit system can only benefit participants in the credit system, since these participants do not face mandatory emissions targets and thus can only benefit from the opportunity to sell

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\(^7\) See Jaffe, Ranson, and Stavins, 36 Ecol L Q at 799 (cited in note 4).

\(^8\) See Metcalf and Weisbach, 6 Rev Envir Econ & Poly at 116 (cited in note 3).
emissions credits at higher prices. Hence, there is enthusiastic support for the Clean Development Mechanism from the UNFCCC’s non-Annex I countries. 9

3. National control

Because linkage exposes a domestic system to the design features and market developments of any system to which it is linked, linkage can reduce national control over the economic and environmental impacts of domestic climate change policies. However, the degree to which domestic systems lose control depends on whether links are two-way or one-way. For example, cost-containment measures—such as banking, borrowing, offsets, or safety-valve provisions—will propagate completely across a two-way link between two cap-and-trade systems. In contrast, under a one-way linkage, cost-containment measures will propagate only to the system that accepts the other’s allowances. 10

4. Incentives for setting caps

An additional concern about linkage is that it changes the incentives that jurisdictions face when setting their respective emissions caps. 11 Because a link can affect the allowance price within a linked jurisdiction, it can alter the fundamental tradeoff a government faces between the value it can create by issuing additional allowances and the marginal environmental damage that can arise from issuing such allowances. By expanding the scope of the allowance market, linkage can reduce the impact that the issuance of additional allowances has on allowance prices and therefore on the value of existing allowances. Further, by allowing nations with high domestic emission reduction costs to purchase less expensive emission reductions from other systems, linking can reduce the costs that such nations would face in committing to more stringent caps, thereby partially offsetting some of these effects.

For example, when a small cap-and-trade system establishes a direct link with a larger cap-and-trade system, the administrator of the smaller system may be tempted to issue a larger number of allowances in order to raise government revenues or benefit domestic firms. Alternatively, linkage to the larger allowance market may allow the smaller system to tighten its cap dramatically, achieving its targets by displacing costs onto foreign firms in the linked system.

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10 Technically speaking, some price effects of cost-containment measures do propagate in both directions of a one-way linkage, via supply and demand effects in the linking and target systems.
III. CHARACTERISTICS OF EXISTING AND PROPOSED LINKAGES

Despite the hiatus in the US of serious consideration of a national CO$_2$ cap-and-trade system, such systems are in place or under development in the European Union, Switzerland, Australia, New Zealand, South Korea, Mexico, California, the northeastern US, and several Canadian provinces, and are under consideration in Japan and parts of China. Additionally, a global emissions-reduction-credit scheme (the Clean Development Mechanism) has an important constituency of supporters in the world’s developing countries. In this section, we review these systems and describe existing and proposed links among them.

A. Linkage Among Existing Trading Systems

Because governments face strong economic and political incentives to link to other systems, there are already a number of links established or proposed between existing tradable GHG (mostly CO$_2$) permit systems.

1. Emissions trading under Article 17 of the Kyoto Protocol

Under the Kyoto Protocol, each Annex I country took on a quantitative emissions target for the 2008 to 2012 compliance period. These emissions targets are expressed in Assigned Amount Units (AAUs). Under Article 17 of the protocol, AAUs may be bought and sold by national governments, with the condition that each government must have a sufficient number of AAUs at the end of the compliance period to cover its actual emissions. When two governments exchange AAUs, they create an implicit link between their domestic climate policies.

An important obstacle to the successful operation of such a system is that by its very nature, the trading is among nations. Unlike private firms, nation-states are not simple cost-minimizers, and so there is no reason to anticipate that competitive pressures will lead to equating of marginal abatement costs across countries. Furthermore, even if nations did try to minimize costs, they would not have sufficient information about the marginal abatement costs of domestic firms to define their own national aggregate marginal cost functions. Thus,

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13 See Wara, 445 Nature at 595 (cited in note 9).
15 See Hahn and Stavins, What Has the Kyoto Protocol Wrought? at 10 (cited in note 3).
16 Id at 9.
such a system does not have the cost-effectiveness property ordinarily associated with tradable permit systems among firms, and the notion of linkage via trading between countries may be more of a metaphor than a practical policy. To date, sales of AAUs have been modest relative to sales of other types of credits.17

2. Clean Development Mechanism

The Kyoto Protocol’s Clean Development Mechanism (CDM) is the world’s largest emissions-reduction-credit system.18 Under the CDM, firms and other entities in non-Annex I (developing) countries can be awarded certified emission reduction (CER) credits for conducting voluntary projects that reduce greenhouse gas emissions.19 These projects can take a variety of possible forms, such as building new wind farms, installing more energy efficient equipment in manufacturing facilities, or capturing methane from landfills.20 CERs can then be purchased by regulated emitters in Annex I countries for use in meeting their domestic emissions commitments.21 CERs could also be used for entities covered by cap-and-trade systems in countries that are not parties to the protocol (in particular, the US).22

From the perspective of the developing countries, the CDM provides a mechanism for financing “sustainable development.”23 From the perspective of the industrialized countries, the CDM provides a means to engage developing countries in the control of GHG emissions while simultaneously reducing the costs of achieving domestic emissions targets.24 Because it tends to be much less expensive to construct new low-carbon energy infrastructure in developing nations than to modify or replace existing infrastructure in industrialized

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20 Id.
21 Id.
23 See Kyoto Protocol, Art 12 § 2.
24 Id.
countries, international trading in CERs could significantly reduce the aggregate cost of compliance with the Kyoto Protocol.

A number of cap-and-trade programs explicitly allow the use of CDM credits, including existing systems in the European Union, Switzerland, and New Zealand, as well as a future system in Australia. Most CDM projects have been funded by European parties: Investors in the United Kingdom have sponsored 31 percent of all CDM projects, Swiss investors have sponsored 21 percent, Japanese investors 10 percent, Dutch 9 percent, Swedish 7 percent, and German 5 percent.

The CDM has accounted for annual CO₂-equivalent reductions of 278 million tons, about 1 percent of annual global emissions of CO₂. The largest shares of CERs have been generated in China (55 percent) and India (15 percent), with Latin America and the Caribbean making up another 14 percent of the total. Brazil, at 6 percent, is the largest CER producer in that region. Of the CERs expected to be generated by projects in the CDM pipeline by 2012, 35 percent are for renewables, 29 percent are for HFC and N₂O reduction, 19 percent are for methane reduction, and the remaining 17 percent are for electricity generation, fuel switching, and other projects.

As an ERC system, the CDM raises important concerns about additionality (the problem of whether basing credits on an unobservable hypothetical baseline leads to credits being granted for emission reductions that would have occurred in any case). Empirical analysis has validated these concerns, with estimates that

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28 See Wara, 445 Nature at 595 (cited in note 9). Note that carbon sequestration projects of forestation and reduced deforestation are not included in the CDM under the Kyoto Protocol’s first commitment period, 2008–12.


many claimed reductions would have occurred even in the absence of the program.\textsuperscript{31}

An additional concern has centered on the fact that nearly 30 percent of average annual CERs have come from the destruction of HFC-23, a potent GHG that is a byproduct of the manufacture of certain refrigerant gases.\textsuperscript{32} It is very inexpensive to destroy HFC-23, and companies can earn nearly twice as much from the sale of CDM credits as they can from selling respective refrigerant gases.\textsuperscript{33} As a result, it has been argued that plants were being built simply for the purpose of generating CERs from destruction of HFC-23. Because of this, beginning in 2013, CERs from HFC-23 destruction will not be valid for purposes of compliance with the EU Emissions Trading System.\textsuperscript{34}

As negotiations continue regarding the details of a second commitment period for the Kyoto Protocol, the CDM will most likely continue to function in any case.\textsuperscript{35} However, a variety of proposals have been put forward to improve its structure and implementation, many targeted at increasing the additionality of approved projects.\textsuperscript{36} There have also been discussions of alternative mechanisms for engaging developing countries, such as "new market mechanisms" for sectoral crediting.\textsuperscript{37}

3. Joint Implementation

Joint Implementation (JI) is another Kyoto Protocol flexibility mechanism. It allows entities in Annex I countries to generate and sell offset credits—known as Emission Reduction Units (ERUs)—to one another.\textsuperscript{38} Like the CDM, JI is a


\textsuperscript{33} Wara, 445 Nature at 596 (cited in note 9).


\textsuperscript{38} See Joseph Aldy and Robert N. Stavins, \textit{The Promise and Problems of Pricing Carbon: Theory and Experience}, Belfer Center Discussion Paper *17 n 16 (Harvard University Nov 2011), online at
project-based ERC system whose credits raise concerns about additionality, although the concerns are somewhat different since countries that can participate in JI projects have caps under the Kyoto Protocol.

The market for ERUs has been less robust than the market for CERs. As of April 2012, host countries had issued 233 million ERUs. Of the 612 approved projects, 194 were based in Ukraine, 178 in Russia, 59 in the Czech Republic, 39 in Bulgaria, and 25 in Poland, with the remainder primarily in Europe.

4. European Union Emissions Trading System

The European Union Emissions Trading System (EU ETS) is a downstream CO\textsubscript{2} cap-and-trade system that is by far the world’s largest carbon pricing regime. This system, which was adopted in 2003, covers about half of CO\textsubscript{2} emissions from thirty European countries. The EU ETS has been implemented in phases: a first (pilot) phase from 2005 to 2007, a second (Kyoto) phase from 2008 to 2012, and a scheduled third phase from 2013 to 2020. Although the first phase allowed trading only in carbon dioxide, the second phase broadened the program to include some other GHGs from certain industrial sectors, such as nitrous oxide emissions from nitric acid production. The 11,500 regulated sources include large sources such as oil refineries, combustion installations over twenty megawatts thermal, coke ovens, cement factories, and pulp and paper producers. Although EU ETS allowance prices averaged €22 in the second half of 2008, prices had fallen to €7 in 2012 as the economic recession brought reduced economic activity and decreased demand for allowances.


40 Id.


42 Id. The EU ETS covers all 27 EU member states plus Iceland, Liechtenstein, and Norway. Iceland, Liechtenstein, and Norway joined the EU ETS in 2008, although sources in Iceland are not yet subject to an emissions cap.


44 In addition, a set of “complementary policies,” such as those aimed at increasing the use of renewable sources of energy, have had the effect of reducing emissions in one sector only to see them increase in other sectors under the EU ETS umbrella, thereby accomplishing no additional net emissions reductions, but increasing aggregate costs (decreasing cost effectiveness) by
The European Commission's Linking Directive allowed EU ETS participants to use CERs from the CDM beginning in 2005 and ERUs from the JI program beginning in 2008, although certain types of projects, such as land use change, forestry, and nuclear power, have not been eligible for credits.45 and industrial gas destruction projects will cease to be eligible after 2013.46 Because of these links, CER and ERU prices are heavily dependent on EU ETS allowance prices.47

During the first and second trading periods, EU ETS member nations each set national limits on the use of credits as a percentage of total allowances, with limits ranging from 0 percent in Estonia to 20 percent in Lithuania and Spain.48 In future trading periods, the European Commission has mandated that no more than half of the EU ETS overall emissions reductions target may be achieved through credits. Furthermore, for projects initiated in 2013 or later, the EU ETS will recognize CERs only from nations on the UN's list of Least Developed Countries (LDCs) (most of which are in Africa), thereby eliminating projects from the countries that currently dominate the supply, most notably China and India. CERs flowing from projects begun prior to 2013 in more developed non-Annex I countries will continue to be allowed.49

To some degree, the EU ETS can itself be viewed as a large multilateral linkage among its member counties, in which each country recognizes allowances issued by all other members.50 This was particularly true in the first and second trading periods, during which each country proposed its own maintaining heterogeneous marginal abatement costs, and reducing allowance prices in the EU ETS.


individual emissions cap for review by the European Commission. This created incentives for individual countries to try to be generous with their allowances to protect their economic competitiveness. Not surprisingly, the result was an aggregate cap that—at least in Phase I—exceeded business-as-usual emissions. However, for future trading periods, caps have been determined through a more centralized process at the EU level.

5. Norwegian Emissions Trading Scheme

From 2005 to 2007, Norway operated an Emissions Trading Scheme, which covered 10 percent to 15 percent of national CO₂ emissions and imposed a cap equal to 95 percent of 1998–2001 levels. The system included a one-way linkage with the EU ETS, which allowed Norwegian firms to meet their compliance obligations by purchasing emissions permits from the EU ETS. In 2007, the three non-EU member countries of the European Economic Area—Norway, Iceland, and Liechtenstein—joined the EU ETS through the adoption of the EU ETS Directive into the European Economic Area (EEA) agreement. With this agreement, Norway and the other EEA members agreed to follow the same process for setting national caps as the EU member states.

53 Due to a variety of factors, including the economic recession and the ability of regulated entities to bank allowances into Phase III, it is difficult to assess the system's performance in Phase II.
55 The Norwegian ETS was designed to be compatible with the EU ETS. See M.J. Mace, et al, Analysis of the Legal and Organisational Issues Arising in Linking the EU Emissions Trading Scheme to Other Existing and Emerging Emissions Trading Schemes 6 (Study Commissioned by the European Commission Directorate General–Environment, Climate Change, and Air, May 2008).
6. Swiss CO₂ Act

Since 2008, Switzerland has operated a quasi-voluntary cap-and-trade system based on the authority of its CO₂ Act. Under this program, companies can be exempted from a mandatory CO₂ tax on fossil fuels in exchange for taking on a legal commitment under the cap-and-trade system. Under the Swiss system, companies may meet up to 8 percent of their emissions targets using CDM and JI credits. Although Swiss and EU participants cannot currently use each other's allowances, the Swiss government has begun negotiations with the European Commission to create a link between the Swiss trading program and the EU ETS, mostly likely starting in 2014.

7. New Zealand Emissions Trading Scheme

In January 2008, the New Zealand Emissions Trading Scheme (NZ ETS) was launched. The forestry sector entered the program first, in 2008, and stationary energy, industrial, and liquid fossil fuel sectors joined in 2010. Early evidence suggests that the forestry component has deterred deforestation, although international policy and consequent price uncertainty are major problems for investment. The waste (landfills) sector is scheduled to enter in 2013, and agriculture—which accounts for nearly half of New Zealand’s gross emissions—is scheduled to enter in 2015. Thus, the intention of the system is to include all sectors of the economy and all greenhouse gases by 2015. The NZ ETS features free allocation of allowances, with special protections (output-based updating allocations) for emission-intensive, trade-sensitive sectors, as well as a safety valve that allows participants to meet their obligations by paying a fee of NZ$25 per ton. Additionally, a recent five-year government review


65 Id at 29; New Zealand Climate Change Response Act, Pub Act 2002 No 40 § 222C (Nov 18, 2005).
recommended that the agriculture sector face a lower price as it enters the system.\footnote{\textit{Emissions Trading Scheme Review Panel, Doing New Zealand's Fair Share} at 8 (cited in note 64).}

Currently, the NZ ETS allows participants to use an unlimited number of credits from the CDM and JI programs, as well as AAU allowances converted from other UNFCCC signatories.\footnote{See Ministry for the Environment and the Treasury, \textit{The Framework for a New Zealand Emissions Trading Scheme} 46–48 (Sep 2007), Pub No. ME 810.} Preliminary emissions registry data suggest that 20 percent of New Zealand emissions have been covered using relatively inexpensive AAUs from Hungary.\footnote{\textit{Recent Global Carbon Politics}, 7:34 Carbon Market North America 5 (Reuters 2012), online at \url{http://www.pointcarbon.com/polopoly_fs/1.1972695/CMNA20120831.pdf} (visited Nov 4, 2012).

69} However, certain categories of offset credits are not eligible, such as those based on HFC-23 and N$_2$O industrial gas destruction.\footnote{See New Zealand Ministry for the Environment, \textit{Guidance on the Use of CERs in the NZ ETS} (Feb 2012).} The ETS also includes several features intended to protect participants from the potential price effects of international demand for its allowances (known as New Zealand Units, or NZUs). The establishing legislation prohibits export of NZUs if the total number of NZUs held within the country falls below 90 percent of the initial allocation for that trading period. Additionally, in response to the recession, in 2009 the New Zealand government prohibited participants in all sectors except forestry from exporting any allowances until 2013.\footnote{See New Zealand Climate Change Response Act, Pub Act 2002 No 40 at § 222G.}

Some features of the New Zealand ETS, particularly the way that allowances are allocated, were chosen for compatibility with Australia’s previously proposed Carbon Pollution Reduction Scheme (CPRS). Although the CPRS never became law, the possibility of linking to a future Australian system was—and is—an important consideration for the New Zealand ETS, especially in light of the close trade relationship between the two countries.\footnote{See Emissions Trading Scheme Review Panel, \textit{Doing New Zealand's Fair Share} at 28 (cited in note 64).}

Establishing a direct linkage between the New Zealand ETS and the EU ETS poses greater challenges. Because forest sink credits are a major part of the New Zealand ETS but are not allowed by the EU ETS, the creation of a direct link between the two systems is unlikely in the near future. However, as a result of its direct link to the CDM, the New Zealand ETS does have an indirect linkage to the EU ETS. Because non-forestry New Zealand sources are required to surrender only one allowance per two units of emissions until 2013, the current effective price of NZ allowances is very low.

8. Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) is a downstream cap-and-trade program that limits CO₂ emissions from power sector sources in nine northeastern US states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont). Like the EU ETS, RGGI can be envisioned, to some degree, as a linked set of state-level cap-and-trade programs.

The system is both narrow in its sectoral coverage and unambitious in terms of its emissions reduction objectives. RGGI took effect in 2009 after approval by individual state legislatures and set a goal of lowering emissions to 10 percent below 2009 levels by 2019. It was originally anticipated that meeting this goal would require a reduction of approximately 35 percent below business-as-usual emissions levels. However, due to the combined effects of the economic recession and drastic declines in natural gas prices relative to coal prices, the cap is no longer binding and is unlikely to become binding through 2020, unless the cap trajectory is adjusted.

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78 Id.
The Model Rule governing RGGI's implementation allows for two types of one-way linkages. First, covered sources may meet up to 3.3 percent of their compliance obligations using allowances generated by certain types of offset CO₂ projects located in one of the RGGI states or in another US jurisdiction that has completed a memorandum of understanding with the RGGI states. The 3.3 percent limitation was chosen so that no more than half of all emissions reductions between 2009 and 2020, relative to projected baseline emissions at the time the Model Rule was written, would be achieved using offsets. To address uncertainty about future abatement costs, the rule includes price triggers that allow greater use of offsets if average annual allowance prices exceed certain thresholds. If the price exceeds $7 (in 2005 dollars), sources may use offsets for up to 5 percent of their compliance obligations, and if the price exceeds a “stage two threshold price” that begins at $10 in 2005 and increases by about 2 percent each subsequent year, then sources may use offsets for up to 10 percent of their compliance obligations.

The second type of linkage allowed by RGGI is one-way linkage to other international CAT and ERC systems. If annual allowance prices exceed the “stage two threshold price,” then RGGI sources may satisfy their compliance obligations using CERs from UNFCCC emissions-reduction-credit programs or allowances from any other cap-and-trade system outside the United States.

As of the spring of 2012, no applications for approval for offset projects have ever been submitted to RGGI because of the low RGGI allowance price. Furthermore, because RGGI prices have remained far below the $10...
stage two threshold price, RGGI sources have never been permitted to use CERs or other CAT systems' allowances.86

B. Possible Linkage Among Future Trading Systems

Several new cap-and-trade systems will come into effect in the near future. Although details of these systems remain to be determined through promulgation of specific regulations, the respective authorizing legislation provides insights into the likely future role of linkage in each system.87

1. Australia’s Clean Energy Act of 2011

In 2011, Australia’s government passed its Clean Energy Act, which imposes a carbon tax of approximately AUD$25/ton for the period from 2012 to 2015, after which the tax is to be replaced by a cap-and-trade system.88 The Act includes a number of features directed at possible linkage with other systems. Import and export of allowances is allowed,89 although the government may set charges on international allowances and credits of up to AUD$15 in 2015, AUD$16 in 2016, and AUD$17.05 in 2017.90

Furthermore, the government is tasked specifically with developing regulations on the use of foreign allowances that take into account Australia’s international objectives and obligations as well as the environmental integrity of Australia’s system.91 As discussed above, Australia and New Zealand have announced plans to link their trading systems beginning in 2015, once Australia’s carbon tax converts to a cap-and-trade system.92 Additionally, Australian and European Commission officials have announced plans to allow Australian cap-and-trade participants to use EU ETS allowances to cover up to 50 percent of their liabilities starting in 2015, via a one-way linkage. By 2018, the EU and Australia have agreed to establish a full two-way linkage between their emissions trading systems. To facilitate this connection, Australia has agreed to drop its plans for a carbon price floor and to limit the use of Kyoto credits (such as CERs and ERUs) to no more than 12.5 percent of total emissions.93

86 See RGGI, Part XX CO2 Budget Trading Program at 17–18, 63 (cited in note 80).
87 We exclude some systems from our analysis. As of early 2012, British Columbia, Manitoba, and Ontario have not yet finalized cap-and-trade regulations.
88 See Australia Clean Energy Act, No 131 § 100.
89 Id at §§ 108–09.
90 See Australian Clean Energy International Unit Surrender Charge Act 2011, No 158 § 8.
91 See Australia Clean Energy Act, No 131 § 123.
92 See Combet and Groser, Joint Media Release (cited in note 73).
2. California’s Global Warming Solutions Act of 2006

California’s Global Warming Solutions Act of 2006 directed the California Air Resources Board (CARB) to promulgate regulations to achieve the goal of reducing the state’s greenhouse gas emissions to 1990 levels by the year 2020, a very ambitious target by North American standards. In 2011, CARB finalized a rule that establishes a cap-and-trade system as the primary mechanism by which the state will achieve this goal, beginning in 2013.94 The regulation includes several cost-containment measures, including banking of allowances and a strategic allowance reserve, as well as allowing for linkage to other systems.95

Two types of links are allowed by current regulations governing the cap-and-trade system. First, facilities may use offsets (of any approved type) for up to 8 percent of their compliance obligations.96 Initially, credit will only be given for offsets from US based projects involving forestry, dairy digesters, and destruction of ozone-depleting substances. However, the regulations create a framework for possible future linkage to CDM, JI, and other international ERC programs,97 and California has completed a joint memorandum of understanding with Chiapas, Mexico, and Acre, Brazil, that could allow the use of avoided deforestation offsets from these two states as soon as 2015.98 Second, the regulations allow for unrestricted use of allowances from directly linked cap-and-trade systems.99 In March 2012, regulations were proposed that would create a two-way direct link with Québec’s cap-and-trade system, although this linkage

95 Id.
97 See California Environmental Protection Agency, Overview of ARB Emissions Trading Program (cited in note 94).
was delayed by a legislative subcommittee in 2012. Links with other US states and Canadian provinces may come later via the Western Climate Initiative.

3. Québec’s cap-and-trade system

In 2011, the Québec government adopted regulations establishing a cap-and-trade system for industrial facilities emitting more than 25,000 tons of CO₂ per year. This system, which will begin capping emissions starting in 2013, is explicitly based on design criteria established by the Western Climate Initiative. Indeed, the regulation allows for linkage with other cap-and-trade systems with which the government of Québec has concluded an agreement, and Québec plans to link to California’s cap-and-trade system. However, the Québec system restricts facilities from using domestic offsets to cover more than 8 percent of their emissions and does not currently allow linking with international sources of offset credits, such as the CDM.

4. China’s emissions trading system pilots

In late 2010, the Chinese government released its Twelfth Five-Year-Plan, which calls for the establishment of a national carbon emission trading system by 2015. The government has begun work to establish pilot cap-and-trade programs in the cities of Beijing, Tianjin, Shanghai, Chongqing, and Shenzhen, and the provinces of Hubei and Guangdong, by 2013 or 2014. Because the

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101 See Western Climate Initiative, Design for the WCI Regional Program 22 (July 2010). The Western Climate Initiative originally was to include eleven western US states and Canadian provinces, and now is likely to begin with California, Ontario, and Québec, which are contemplating linking their developing state/provincial CO₂ cap-and-trade systems beginning in 2013.


basic characteristics of these pilot systems (such as whether they will be mandatory or voluntary, whether the caps will be absolute or intensity-based, and what industries will be included) remain to be determined, it is not clear whether or how these trading programs might link to other cap-and-trade or credit systems.

5. South Korea’s cap-and-trade system

In May of 2012, South Korea’s parliament voted to establish a cap-and-trade program that will take effect in 2015. The program will apply to companies whose annual emissions are greater than 125,000 metric tons of CO₂, as well as to some smaller factories, buildings, and livestock producers. The government has not yet promulgated regulations governing offsets or linkage to other systems.

6. Mexico’s cap-and-trade system

In June of 2012, Mexico passed climate change legislation to establish a voluntary cap-and-trade system. Companies who opt in to the system would be able to sell their allowances in international markets. Although the details of the system remain to be worked out, Californian officials have already expressed interest in exploring a future linkage between California’s system and the Mexican system.


In 2009, the US House of Representatives passed the American Clean Energy and Security Act (also known as the Waxman-Markey Bill), which would have established a national CO₂ cap-and-trade system in the US. Although the bill never became law, it offers some insight into US political preferences regarding linkage with other systems. The bill would have allowed US firms to use emissions allowances from foreign cap-and-trade systems, such as the EU

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ETS, but would have given the US Environmental Protection Agency the option of establishing a limit on the percentage of a firm’s emissions that could be covered by such foreign allowances. The bill would also have allowed the use of both domestic and foreign (such as CDM) offset credits, with a combined quantitative limit of up two billion tons per year (compared with a total emissions cap of approximately five billion tons). Starting in 2018, the bill would have applied an exchange rate of 1.25:1 when redeeming foreign offsets.

IV. THE DURBAN PLATFORM AND ITS IMPLICATIONS FOR LINKAGE

A considerable number of linkages have been established or are likely to be established among regional, national, and sub-national tradable permit systems. For better or worse, these linkages have been heavily influenced by the longstanding UNFCCC distinction between Annex I and non-Annex I responsibilities. In particular, because the UNFCCC institutional framework has not encouraged developing countries to establish cap-and-trade systems, all links to developing countries have been through the CDM—an emission-reduction-credit system with flaws related to lack of full additionality. However, the Durban talks have opened up an opportunity for a new international framework that could employ linkage to engage developing countries, reduce the global costs of emissions reductions, and develop an institutional framework for a future top-down or bottom-up international climate policy architecture.

A. The UNFCCC, the Berlin Mandate, and the Kyoto Protocol

Article 3 of the 1992 UNFCCC established a key principle:

The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

The countries considered to be “developed country Parties” were listed in an appendix to the 1992 Convention (Annex I) which included the members of the Organisation for Economic Co-operation and Development (OECD) plus most of the emerging market economies of eastern Europe and the former Soviet Union.

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112 Id at §§ 721(e), 722(d)(1).
Three years after the Rio conference, at the first Conference of the Parties of the Framework Convention (COP-1) in Berlin, the global community agreed to the “Berlin Mandate.” This agreement developed a specific interpretation of “common but differentiated responsibilities” by establishing the dichotomous distinction whereby the Annex I countries are to take on emission-reduction responsibilities and the non-Annex I countries are to have no such responsibilities whatsoever.

The Berlin Mandate, subsequently codified in the 1997 Kyoto Protocol via numerical national targets for a limited set of countries, had wide-ranging, worldwide consequences. The dichotomous structure has driven up aggregate compliance costs to as much as four times their cost-effective level, because many opportunities for low-cost emissions abatement in emerging economies are taken off the table. More problematic, an institutional structure was thereby put in place that makes change and progress exceptionally difficult, if not virtually impossible.

B. A New Approach Requiring Participation of All Parties

At the December 2011 UN talks in Durban, South Africa (COP-17), the international community agreed to a negotiating process focused on the long-term participation of all parties in the effort to mitigate greenhouse gas emissions and combat climate change. In particular, they adopted the goal of reaching an agreement by 2015 that will bring all nations under the same legal regime by 2020.

This Durban Platform for Enhanced Action completely eliminates the Annex I/non-Annex I (or industrialized/developing country) distinction. Nowhere in the text of the decision will one find phrases such as “Annex I” or “historical responsibility,” which had long since become code words for emission targets applied exclusively to the richest countries.

Negotiators from around the world now have a challenging task before them: to identify a new international climate policy architecture that is consistent with the process, pathway, and principles laid out in the Durban Platform, while still being consistent with the UNFCCC. In other words, the challenge is to find a way to include all countries (or at least, the twenty largest national and regional economies that together account for upwards of 80 percent of global GHG emissions).

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114 See UNFCCC, Reports of the Conference of the Parties on its First Session, Held at Berlin from 28 March to 7 April 1995 [June 6, 1995], FCCC/CP/1995/7/Add.1.


emissions) in a structure that brings about meaningful emission reduction on an appropriate timetable at acceptable cost, while recognizing the different circumstances of nations in a way that is more subtle and sophisticated than the simple dichotomous distinction of years past.

Although the Durban Platform opens up a window to a variety of promising international policy architectures, its implications for architectures based on linkage are particularly important. By lessening a key obstacle to the most meaningful international linkages—the absence of cap-and-trade systems in developing countries—the Durban Platform has improved the chances of future direct linkages among tradable permit systems in developed and developing countries. Such linkages could serve a variety of roles in international climate policy architecture.

V. LINKAGE AS A CLIMATE POLICY ARCHITECTURE

We consider the role that linkage could play in international climate policy architecture. Our examination is informed both by political interest in and economic experience with linkage. The existing and planned links among regional, national, and sub-national climate change policies—as documented in Section III—provide preliminary evidence regarding both the near-term and long-term roles that linkage may play in global climate policy architecture.

A. Near-Term Role

In the years since the ratification of the 1997 Kyoto Protocol, a patchwork system of linkages has evolved among independent regional, national, and sub-national climate policies. As described above, the current set of existing and planned international links includes a number of direct connections: links between trading systems in Europe, including the EU ETS, the EEA countries, and (most likely in 2014) Switzerland; the planned links among the members of the Western Climate Initiative, including the recently-announced linkage between California and Québec; and the planned link between Australia’s forthcoming cap-and-trade system and the New Zealand ETS, as well as between Australia’s system and the EU ETS (a development that could create an indirect linkage between the EU ETS and New Zealand’s ETS). Furthermore, the CDM and JI offset markets provide a strong indirect linkage between the European systems and the New Zealand ETS, and, depending on future allowance prices, could provide an indirect linkage to RGGI.

117 See generally Aldy and Stavins, eds, Post-Kyoto International Climate Policy (cited in note 3); Posner and Weisbach, Climate Change Justice (cited in note 1).
This sample of existing and planned links hints at the outline of a near-term “system” that combines several regional, directly linked cap-and-trade systems, with some level of indirect connection via a common credit system, such as the CDM or a sectoral crediting program. Until a specific international agreement is realized, such a bottom-up, decentralized system may become the de facto structure for near-term to medium-term international climate policy architecture.\textsuperscript{118}

Such a de facto near-term system could play two roles. First, it could provide economic benefits such as cost savings and market liquidity while (presumably) a future climate agreement is being negotiated. Second, by helping to build an institutional framework of coordination among different systems, near-term linkage could help with the political transition to a robust long-term international climate policy architecture. We discuss these roles in more detail in the following subsections.

1. Can linkage provide near-term cost savings and market liquidity?

In the short term, linkage may provide two main economic contributions: creating cost savings, and improving market liquidity and stability. As discussed in Section II, the key economic rationale for linking two systems is to lower the aggregate costs of emissions reductions. Because GHG emissions have the same effect on climate change regardless of where in the world they originate, linkage allows firms in high-cost systems to pay for less expensive abatement opportunities in lower-cost systems while still achieving the same overall environmental benefit. Furthermore, because linkage increases the number of market participants available to buy and sell allowances and credits, it can thicken markets and reduce problems with price volatility.

Experience suggests that direct linkages between cap-and-trade systems do in fact help to improve market functioning. The best example of the economic benefits of direct linkage comes from the EU ETS. Although allowance markets during the EU ETS trial phase showed signs of thinness, more recent trading periods have had higher volumes and greater efficiency.\textsuperscript{119}

However, although linkage can help with market functioning, the near-term cost savings from direct links between cap-and-trade systems may be modest. Because two-way links are currently planned primarily between systems in highly developed nations, direct links may not be able to help regulated firms take advantage of very low-cost abatement opportunities (such as those available in developing countries). Furthermore, direct linkages suffer from a climate

\textsuperscript{118} The Durban Platform calls for an agreement to be reached by 2015 for implementation in 2020.

policy irony: the links that are most attractive for economic reasons—those between systems with very different allowance prices (such as RGGI and the EU ETS)—may be politically the most difficult to establish because of the large international capital flows that such links would generate.

Links with a credit system can also contribute to the near-term goals of cost-minimization and market liquidity. In principle, a near-term set of indirect links could yield much of the cost savings and other advantages of a broad set of multilateral links. This system of indirect links would preserve a high level of national control over domestic carbon markets, thus allowing countries to tailor policies to fit their specific political and economic circumstances.

In practice, the ability of credit systems—in particular, the CDM—to create meaningful indirect links between cap-and-trade systems has been mixed. On the positive side, allowance prices in the New Zealand ETS, which allows unlimited purchase of CDM offset credits, have been strongly influenced by developments in the CDM and the EU ETS. However, despite the potential cost-savings from linking to a credit system, some cap-and-trade systems (such as in California and Québec) have chosen to allow only selected external credits. Others have imposed quantity limits on the use of external credits, have designed application procedures that make it difficult to receive approval for new offset projects, or have implemented trigger mechanisms that only allow the use of foreign offsets if domestic allowance prices exceed some predetermined level. This general reluctance to allow links with credit systems (in particular, with the CDM) is motivated by concerns about additionality, as well as an emphasis on achieving domestic emissions reductions. Therefore, whether indirect links can improve the stability and cost-effectiveness of domestic carbon markets will depend largely on broader acceptance and use of credit systems such as the CDM.

Although indirect linkage has clear benefits, it could also have destabilizing effects on offset markets in developing countries. Such a situation could arise as the result of limits that many systems are placing on the use of external offset credits. Consider a simple example, depicted in Figure 1, in which the world economy contains only two systems: a cap-and-trade system and an emission-reduction-credit system. Suppose that the cap-and-trade system limits the number of offset credits that domestic entities can use for compliance, and that this limit is binding. As a result, the ERC system will have an oversupply of

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121 See Section III.B.2–3.

122 See Section III.A.
emission reduction opportunities that would be profitable at current allowance prices, and the market for credits will fail to clear. The situation is potentially even worse when there are two or more cap-and-trade systems with binding limits on the use of external offsets. Because the market for offset credits will fail to clear, there will be multiple prices for credits, with prices depending on the allowance price in each separate cap-and-trade system. In either case, the markets would face problems with transparency, and the resulting uncertainty could create substantial business risks that might drive up the costs of emissions reductions. In particular, companies that make investments in offset projects would face the risk that they would be unable to sell their CERs at any price due to the binding limits on offset sales.

How likely is such a scenario? Table 1 summarizes limits on the use of offsets and credits for compliance in existing and planned systems. The table shows, for example, that after 2013, credits may make up no more than half of aggregate EU ETS emissions reductions. Other systems have also imposed limits. If nations pursue substantial emissions reduction goals while maintaining limits on offset credits, it is possible that limits on offsets will increasingly bind. The current (May 2012) discount of CER prices relative to EU ETS allowance prices suggests that this may already be happening.

2. Can linkage provide a foundation for a future policy architecture?

Although most of the ongoing discussions about potential linkages focus on the economic benefits of linking systems with different marginal abatement costs, linkage may provide an additional set of benefits, which are fundamentally political. By helping to build an institutional framework of coordination among different systems, near-term linkage could help create a pathway to a robust long-term international climate policy architecture.

In the short term there will probably be several regional sets of directly linked systems, with some indirect linkage through the CDM or other offset/sectoral crediting programs. Based on the limited political evidence available to date, this system may transition toward a system with greater numbers of two-way and multilateral direct links. Such a network of linked cap-and-trade systems would preserve some national autonomy while requiring increased coordination of legislation, regulation, and institutions. Thus, in the same way that the General Agreement on Tariffs and Trade transitioned into the World Trade Organization, a bottom-up system of links could, in principle, provide the basic institutional framework for a broader climate agreement. The

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creation of a broad set of links could generate not only experience but also some
degree of mutual trust among nations, and could supply at least a natural starting
point for diplomatic negotiations.

Of course, linkage could also create political and regulatory obstacles to a
future agreement. Creating a linkage between two systems requires agreement
about a variety of design characteristics, including the stringency of the cap in
each system. Because linkage can make it difficult for countries to change such
design characteristics, it might make it more difficult for countries to make the
adjustments necessary to support some future climate agreement.

Linkage could help to support a future climate agreement in another way: by
providing participation incentives for nations to adopt market-based climate
policies. Major developed countries with cap-and-trade systems may be expected
to attempt to use offset programs as both a carrot and stick to stimulate
developing country participation.

The best example of this may be EU ETS policy toward CDM offsets from
developing countries. Whereas between 2008 and 2012 the EU ETS allowed
regulated entities to use CDM credits originating in any developing country,
begging in 2013 new CDM credits will only be allowed for projects originating
in LDCs (thus excluding China and India). This policy shift is deliberate;
recent EU documents state that “[w]hile initially the use of international credits
was allowed for cost-effective compliance, this has been complemented with the
objective of actively using the leverage the EU possesses as the by far most
important source of demand for international credits.” Furthermore, the EU
ETS website states that the “EU has set out a vision for the development of an
international carbon market: the market is expected to develop through bottom-
up linking of compatible domestic cap-and-trade systems.” An OECD-wide
carbon market is expected by 2015, which would be extended to include
economically more advanced developing countries by 2020 and “[n]ew sectoral
crediting mechanisms would be a stepping stone towards establishing cap and
trade systems in these developing countries.” Whether or not this EU linkage
strategy will be effective is difficult to predict.

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124 See European Commission, Questions and Answers on Use of International Credits in the Third Trading Phase of the EU ETS 1 (cited in note 49).
125 Id.
127 Id.
3. Obstacles to near-term linkage

It is important to keep in mind that a variety of political, institutional, and economic factors will determine the types of links that are formed in the near future. Recent political experience suggests that it has not been difficult to establish direct linkages between existing and planned cap-and-trade systems in developed countries. However, these direct linkages are occurring primarily between jurisdictions that already have strong economic, political, and/or geographic ties.

One obstacle to the establishment of additional direct links between cap-and-trade systems is the need to harmonize cost-containment measures and reach mutual agreement about emissions caps. This may prove to be a particular challenge for a direct link between the EU ETS and North American cap-and-trade systems. For example, because California’s system includes an allowance reserve and RGGI’s system includes an allowance price trigger for the use of additional offset credits, links to the EU ETS would result in automatic propagation of these cost control measures.

An additional obstacle to direct linkage is the diversity of stringency across systems. For example, a link between RGGI and the EU ETS is unlikely in the near future, given the current difference in allowance prices in the two systems ($1.93 per allowance in RGGI versus $8.53 per allowance in the EU ETS).\(^{128}\) Such a link would result in large capital flows from Europe to the United States, and could be perceived as Europeans subsidizing lackluster US ambition.

Although the idea of linkage to a common credit system is also appealing, given that such a mechanism would not require systems to harmonize design features, such linkage also faces some practical obstacles. First, most existing and planned cap-and-trade systems have placed restrictions on the use of offset credits. Table 1 summarizes these restrictions. The table shows, for example, that although many EU ETS participants have had relatively generous limits on credits for the 2008 to 2012 compliance period, future limits will allow credits to make up no more than half of aggregate EU ETS emissions reductions after 2013. Other systems have also imposed relatively low limits.

Second, although the CDM is currently the world’s most important supplier of offset credits, it is not clear that it will continue in this role in the future. Beginning in 2013, the EU ETS—the largest source of demand for offset credits—will only accept new offsets from CDM projects in LDCs. This requirement implies that China and India, which together have produced 68

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percent of CDM offsets to date, will no longer be eligible to sell CERs into the European market. What program or institution might replace the CDM is unknown. Recent UN discussions have centered on the possibility of “new market mechanisms,” a vaguely defined set of sectoral crediting mechanisms that would require host country engagement and possibly emissions reduction commitments. Other jurisdictions, such as California’s AB 32 system, have begun developing other protocols for certifying emissions reduction credits from international sources.

A third set of obstacles to indirect linkage via a credit system are the policy goals—espoused by many European countries—of achieving domestic emissions reductions and promoting investment in renewable energy sources. Because allowing the use of credits has the effect of reducing allowance prices, linkage to a credit system (or even to a cap-and-trade system with a lower allowance price) reduces incentives for domestic firms to invest in renewable energy and other “green” technologies. The desire to achieve this separate policy goal may create political opposition to linkage. For example, European Commission documents reflect a clear concern that most emissions reductions be achieved domestically. Such emphasis was also exhibited in the Kyoto Protocol: “The acquisition of emission reduction units shall be supplemental to domestic actions for the purposes of meeting commitments.”

**B. Long-Term Role**

In the long term, linkage could contribute to international climate policy architecture in at least two ways. First, linkage could serve as an element of a broader international climate architecture. In such a system, linkage might play several different roles. In the short term, indirect linkages via a common credit system might serve as an implicit framework that would provide market liquidity and some cost savings, while still allowing nations to maintain control over domestic allowance markets. In the longer term, nations might successfully negotiate a top-down climate agreement that specifies targets and timetables for emissions reductions. Such an architecture might include a more comprehensive set of multilateral linkages between industrialized and developing countries that

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131 See *Kyoto Protocol, Art 6 § 1(d).*
132 See *Jaffe, Ranson, and Stavins, Linking Tradable Permit Systems* at 803 (cited in note 4).
would allow nations to achieve more stringent emissions targets at lower aggregate cost.

A second possibility is that a set of unilateral emissions commitments in a pledge-and-review system combined with a decentralized set of links could serve as a stand-alone, bottom-up architecture.\(^{133}\) As discussed above, the near-term outlines of such an architecture may already be emerging, with regional trading partners choosing to link directly with each other, with broader indirect linkages via the CDM or new sectoral crediting mechanisms, and with the Copenhagen Accord\(^ {134}\) and the Cancun Agreements\(^ {135}\) providing a pledge-and-review system of essentially voluntary national targets. As more jurisdictions establish cap-and-trade systems, this somewhat fragmented near-term system could evolve into a broader bottom-up architecture that includes a wide set of direct linkages.

Whether such a decentralized architecture could achieve meaningful environmental results in a cost-effective manner depends on several factors. First, a sufficient number of large emitters would have to agree to participate in the system. Participation by industrialized countries would need to be self-motivated, and there are a number of potential incentives that might induce developing countries to participate. These include positive incentives (carrots), such as development assistance and the opportunity to sell allowances or offset credits, as well as negative incentives (sticks), such as carbon border adjustments or the imposition of graduation requirements as conditions for the opportunity to sell offset credits.

Second, participating nations would have to commit to substantial unilateral emissions reductions. In developed countries, these commitments would most likely be motivated by internal politics. In developing countries, commitments would most likely depend on participation incentives provided by developed countries. The emissions targets would either be decided unilaterally or negotiated during the process of establishing and renewing direct linkages. The set of voluntary commitments made thus far under the Copenhagen Accord and the Cancun Agreements are probably insufficient for achieving the politically endorsed international target of stabilizing greenhouse gas emissions.

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concentrations at 450 ppm CO₂-equivalent (related to limiting average global warming to 2°C).136

Third and finally, for such an international policy architecture to be cost-effective, it would require links among GHG trading systems in industrialized and developing countries. As discussed above, the near-term prospects for such a comprehensive set of links are mixed.

VI. CONCLUSION

By replacing the UNFCCC's Berlin Mandate, the Durban Platform for Enhanced Action has opened an important window. National delegations from around the world now have a challenging task before them: to identify by 2015 (for implementation in 2020) a new international climate policy architecture that is consistent with the process, pathway, and principles laid out in the Durban Platform. This will require finding a way to include all key countries in a structure that brings about meaningful emissions reductions on an appropriate timetable at acceptable cost, while remaining within the overall framework and principles provided by the UNFCCC.

On both a positive and normative basis, there is considerable attraction to bottom-up, decentralized international policy architectures. Among these, the most promising may be linkage among tradable permit systems, whether in the form of a near-term, de facto architecture of organic linkages among regional, national, and sub-national cap-and-trade systems, or in the form of a long-term replacement for the centralized, top-down architecture that characterizes the Kyoto Protocol. The Durban Platform has improved the likelihood of establishing the types of developed-developing country linkages necessary to support these climate architectures.

Table 1: Summary of Limits on the Use of Offset Credits

<table>
<thead>
<tr>
<th>System</th>
<th>Period</th>
<th>Limit as % of Cap</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU ETS</td>
<td>2013- TBD</td>
<td>TBD</td>
<td>(a)</td>
</tr>
<tr>
<td>EU ETS: Austria</td>
<td>2008-2012</td>
<td>10</td>
<td></td>
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<tr>
<td>EU ETS: Belgium</td>
<td>2008-2012</td>
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<td>(b)</td>
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<td>3.3</td>
<td>(c)</td>
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Notes: (a) The European Commission will choose a limit that allows credits to make up no more than 50 percent of emissions reductions. (b) From 2012 to 2015, the government may impose a fee of AUD$15 to AUD$17 per credit. The 12.5 percent limit applies to Kyoto credits (ERUs and CERs). (c) RGGI’s limit rises to 5 percent if allowance prices exceed $7, and to 10 percent if allowance prices exceed approximately $10. (d) Neither California nor Québec recognize offsets from UNFCCC flexibility mechanisms such as the CDM, although California has recently completed an MOU to allow deforestation credits from the states of Acre, Brazil, and Chiapas, Mexico.

Figure 1: Allowance Market with Binding Limit on Offsets

Legend: $D$ represents demand for emissions permits. $S_a$ and $S_c$ represent the supply of domestic allowances and offset credits, respectively. $Q_c$ represents the (binding) limit on offset sales. $S_{a+c}$ represents aggregate supply of allowances and offset credits. $Q^*_a$ and $Q^*_c$ represent the number of allowances and credits that would be supplied at the market price $P^*$. 