COMPARISON AND LINKAGE OF HETEROGENEOUS MITIGATION SYSTEMS IN THE PARIS REGIME

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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