

RECAP15-Policy Brief

No 3

Discussion Paper Series recap15
No 19 (English) – February 2015

Friedel Bolle, Wolfgang Buchholz, Wolfgang Peters, Reimund Schwarze,
Aneta Ufert, Patrick Vetter, Özgür Yildiz

Reciprocity and Trust as Factors for Success in International Climate Policy

Policy recommendations:

Reciprocity and trust can facilitate multilateral agreements in various ways, if they are appropriately used:

- Instruments for climate policy should be designed so that they are compatible with the principle of reciprocity.
- Cost sharing and matching is recommended as these instruments increase the incentives for unilateral and multilateral climate protection activities.
- A hybrid control mechanism consisting of unilateral reporting and an independent external verification proves to be the optimal strategy for fostering trust.
- The current system based on national reporting should gradually be transformed into a MRV architecture based on external mechanisms.
- Satellite-based monitoring is recommended, as it allows independent, external control of CO₂ emissions at low cost and technical stability.

1. Current framework and problem analysis: How to deal with demands for justice and how to promote trust in the context of international climate policy

In climate policy, parties involved in negotiations often adjust their own actions according to the actions of other governments. Hence, the principle of reciprocity has a significant influence as guiding principle in international climate policy.

Aside from the pattern of reciprocity, trust is an important factor in climate negotiations. Due to characteristic features of international climate policy – such as the absence of a supranational body, the autonomy of actors involved in negotiations and the public good character of the environment – mistrust among involved countries is a logical consequence, since there is the inherent problem of free-riders. Trust is, then, an essential prerequisite for cooperative behavior in international relations, so that the issue of monitoring mechanisms for promoting trust can be considered a key success factor for international climate policy.¹

Given the above-described problem sets, the following questions arise:

- How can reciprocity influence the scope of action for multilateral climate agreements?
- What are the effects of cost-sharing mechanisms when considering reciprocity as guiding principle?
- How do trust and accompanying control measures, such as monitoring, influence the scope for multilateral climate agreements?
- How should suitable monitoring, reporting and verification (MRV) mechanisms be designed?

2. The scope of action in international climate policy considering reciprocity

The analytical framework of non-cooperative game theory includes various forms of games that are suited for describing climate policy decision-making situations and negotiation outcomes. According to this, the scope of action for unilateral and multilateral climate protection can be identified by weighing up the costs and benefits of different climate change policies. Hence, as practical experience shows, it seems logical to include reciprocal motives for the kinds of game-theoretical representation of climate negotiations being outlined here.²

Thus, the consideration of reciprocity preferences can reveal that the actual scope for multilateral climate agreements may be larger than previously thought. On the other

hand, unilateral actions are likely to be undertaken less frequently in countries with sufficiently strong reciprocity preferences. This is due to the fact that benefits from unilateral climate measures must compensate not only a country's monetary costs but also the psychological costs that arise from a feeling of being exploited by free-riders, so there is in sum a lower incentive for such unilateral actions to be taken. To conclude, a general statement that demands for "more reciprocity" lead to "more climate protection" cannot be made.³

In contrast to the ambivalent effects of reciprocity, matching mechanisms for cost sharing increase incentives for both, unilateral as well as multilateral climate-protection efforts. Such a shift towards increasing the scope of cooperative equilibriums can be realized as follows: By subsidizing mitigation efforts through dividing costs, the principle of reciprocity becomes transposed from the guiding principle level to the instrumental level, so that lower cost burdens can be offered to active countries and supposed free-riders must bear some of the costs in any case. As a result, unilateral environmental measures would become more attractive for countries already at lower environmental benefit levels than they were in the original situation without cost-sharing mechanisms.⁴

With a multilateral agreement as the main objective, our first policy recommendation is to create mechanisms that are consistent with the principle of reciprocity. Here, particular emphasis should be given towards matching mechanisms for cost sharing, as they increase incentives for unilateral and multilateral climate-protection activities. Hence, the already-implemented UNFCCC Green Climate Fund (GCF) should be seen as a step in the right direction and starting point for further measures. However, this fund only covers the financing of climate projects in developing countries, whereas the group of donors composed mainly of developed countries is not yet being addressed as potential beneficiaries. Keeping in mind that reciprocal matching has been shown to increase incentives for public good contributions;⁵ the Green Climate Fund should be extended so that it becomes accessible to emerging and developed countries as well, in order to promote mutual commitment through mutual subsidies.

A more detailed approach would adapt matching mechanisms to the funding mechanism being proposed for the reduction of strategic adaptation costs by introducing a multi-level climate fund.⁶ By doing so, the Green Climate Fund would, on the one hand, offer a structure allowing different countries with different levels of development

to benefit according to their economic capacities. On the other hand, all parties would still be subsidized through this multi-level cost-sharing mechanism, so that the principle of reciprocity would be respected.

3. The scope of action in international climate policy considering different strategies for trust building

According to common knowledge from game theory, two strategies for information retrieval that differ in terms of their required effort and potential effect on the behavior of actors involved are possible. These strategies are so-called "signaling" and so-called "screening". While screening describes the direct control of an agent, signaling implies that an agent provides information on his own initiative. Applying these fundamental insights on information retrieval to climate policy leads to the following alternatives for MRV architectures:

- (1) The realization of *unilateral* efforts made by each country to obtain relevant data and information or
- (2) the realization of a combined strategy consisting of voluntary data provision (in the sense of signaling) accompanied by a *multilateral* mechanism for MRV accessible for every party involved in climate negotiations.

Here, the objective for a party involved in climate negotiations should be to determine a control mechanism that creates incentive structures that prevent both active, offensive breaches of contract (free-riding/ opportunistic behavior) as well as defensive breaches of contract undertaken in order to avoid costs that may be imposed as a result of possible opportunistic behavior by free-riders.⁷

In this context, conducting *unilateral* efforts for screening should be seen as being critical for various reasons. Although a functioning monitoring system in conjunction with sanctions reduces the risk of an offensive breach of contract, this strategy entails high costs for each country. Furthermore, concerns about the sovereignty of countries arise, as certain information cannot be collected without on-site activities. On the opposite, autonomous reporting ("signaling") indicates a considerable degree of cooperation and, thus, reduces in particular the risk of erroneous defensive breaches of contract. However, it also requires considerable confidence in reporting and information delivery from involved actors and can boost the danger of offensive breaches of contract, meaning opportunistic behavior and free-riding.⁸

Synthesizing the preceding analysis leads us to the conclusion that combining a hybrid monitoring mechanism based on autonomous reporting with an institutionally neutral verification system accessible to each actor is the efficient solution. Independent reporting promotes the individual responsibility of actors and can, in the ideal case, provide better information than unilateral external monitoring measures. In addition, political problems such as possible sovereignty issues can be avoided. An institutionally independent verification mechanism would complement these benefits by expanding the amount of available information. Furthermore, in cases of doubt, countries could seek to verify the correctness of provided information, thus increasing the confidence of those involved and avoiding the high cost of unilateral monitoring efforts.⁹

The current uncertainty and mistrust in unilateral voluntary monitoring processes constitute a major obstacle for developing a comprehensive climate agreement which would have the support of developing, emerging and developed countries alike. In light of the analysis of the previous paragraph, this obstacle seems to require that recommendations for action to overcome the trust problem focus on the realization of independent external monitoring mechanisms in addition to independent reporting. For this purpose, we suggest approaches based on satellite observation of CO₂ concentrations appear to be particularly suitable.

One appropriate mechanism for satellite-based monitoring of CO₂ emissions could be the Atmospheric Infrared Sounder (AIRS) system, based on NASA's Aqua satellite system and the GOSAT satellite mission of the Japanese space agency JAXA. The records of these satellite systems include, among other data, changes in CO₂ concentrations in the troposphere. One problem, however, may be the large amounts of data and possible technical difficulties inherent to satellite-based data collection.¹⁰ Another possible monitoring mechanism has as its starting point satellite data for ground-level CO₂ concentrations. With the help of further information on vegetation indices, vegetation classifications, and statistical methods, reports from individual countries can be validated by taking into account the CO₂ balance of vegetation and drawing conclusions regarding the plant or anthropogenic origins of CO₂ emissions. Based on these measurements, the national coverage of individual countries can be validated and, when necessary, be used for sanction mechanisms, which fosters trust in international agreements so that the probability of achieving a multilateral agreement is increased.

Finally, improvements in the field of international monitoring can also be combined with efforts toward cost sharing and matching. The use of satellite data and the embedding of data from remote sensing and ground measurements are likely to be an important building block for the development of a comprehensive international agreement on climate protection. Consequently, such technical measures should be supported financially through cost-sharing mechanisms. A starting point toward this end could be the “International Partnership on Mitigation and Monitoring, Reporting and Verification (IPMMRV)”, as discussed in the context of the Petersberg Climate Dialogue.¹¹ Adjustment of the IPMMRV guidelines according to the standards of national reports and the monitoring of common mitigation measures should be gradually extended in order realize an agreement on the creation of a global monitoring, reporting and verification architecture at the Paris 2015 negotiations.

¹ See Parks, B. C. and Roberts, J. T. (2008): Inequality and the global climate regime: breaking the north-south impasse. In: Cambridge Review of International Affairs, 21(4), pp. 621-648.

² See, e.g. Buchholz, W. und Peters, W. (2005): A Rawlsian Approach to International Cooperation. In: Kyklos, 58(1), pp. 25-44.

As an example of reciprocal behavior in the context of climate policy, see the US Senate’s Byrd-Hagel Resolution of 1997, which justified the US refusal to sign the Kyoto Protocol due to missing climate contributions from developing countries.

³ See Buchholz, W.; Peters, W. and Ufert, A. (2014): Spielräume für uni- und multilateralen Klimaschutz. In: Zeitschrift für Umweltpolitik & Umweltrecht, 37(3), pp. 326-344.

⁴ Ibid.

⁵ See, e.g. Guttman, J. M. (1978): Understanding collective action: matching behavior. In: The American Economic Review, 68 (2), pp. 251-255; Buchholz, W., Cornes, R. and Rübhelke, D. (2011): Interior matching equilibria in a public good economy: An aggregative game approach. Journal of Public Economics, 95(7), pp. 639-645 as well as Buchholz, W., Cornes, R., and Rübhelke, D. (2014): Potentially harmful international cooperation on global public good provision. *Economica*, 81(322), pp. 205-223.

⁶ Vgl. Peters, W.; Schwarze, R. und Topp, A.-K. (2014): Strategische Kosten der Anpassung durch Klimafonds reduzieren. RECAP15-Policy Brief – Nr. 1, Europa Universität Viadrina, Frankfurt (Oder).

⁷ Vgl. Abbott, K.W. (1993): Trust but verify: The production of information in arms control treaties and other international agreements. In: Cornell International Law Journal, 26, pp. 1-58.

⁸ Ibid.

⁹ Ibid.

¹⁰ See Vetter, P.; Schmid, W. and Schwarze, R. (2014): Efficient Approximation of the Spatial Covariance Function for Large Datasets – Analysis of Atmospheric CO₂ Concentrations. In: Journal of Environmental Statistics, 6(3), pp. 1-36.

¹¹ <http://mitigationpartnership.net/major-topics> (16.02.2015).