

Climate Governance Post-2012 Options for EU Policy-Making

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This Policy Brief presents the preliminary findings of the large-scale research programme ADAM – *Adaptation and Mitigation Strategies: Supporting European Climate Policy*, an integrated project funded by the European Commission DG Research. The Brief provides an overview of policy options for post-2012 climate governance. A first draft was discussed in an ADAM-CEPS seminar on 1 October 2008 with experts from academia, the policy community and civil society. Valuable comments and suggestions from these discussions have been taken into account in this document.

More information on the ADAM project is available at www.adamproject.eu. The Project is co-ordinated by the Tyndall Centre for Climate Change Research (UK) and runs from 2006 to 2009. Its core objective is a better understanding of the trade-offs and conflicts that exist between adaptation and mitigation policies. ADAM will support EU policy development in the next stage of the climate change negotiations.



This paper presents ongoing research being carried out for the EU-funded ADAM project (Adaptation and Mitigation Strategies: Supporting European Climate Policy). Funded by the European Commission and coordinated by the Tyndall Centre for Climate Change Research in the UK, ADAM is an integrated research project running from 2006 to 2009 that will lead to a better understanding of the trade-offs and conflicts that exist between adaptation and mitigation policies. ADAM will support EU policy development in the follow-on stage of the Kyoto Protocol and will inform the emergence of new adaptation strategies for Europe. CEPS is one of 26 participating research institutes in the project (see <http://www.adamproject.eu/>).

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1. Executive Summary

This brief focuses on three issues that are especially important in the long-term development of the climate regime: (a) the challenge of the *fragmentation* of negotiations and governance systems; (b) the challenge of steering and evaluating novel types of *privatised and market-based governance* mechanisms; and (c) the challenge of designing architectures for *global adaptation governance*. These three core issues of fragmentation, privatisation and adaptation can be related to the overarching need to define the *architecture* of the post-2012 regime – and of any subsequent regimes that may follow a Copenhagen agreement.

Our research shows that fragmentation ranges from climate-specific institutions to a broader fragmentation between climate institutions and regimes with universal or cross-issue portfolios. Our findings indicate that climate governance could be strengthened with increased cross-institutional co-ordination, especially between the UN climate regime and the world trade regime, where many interlinkages exist. Our work also indicates that governments should continue to explore opportunities for further issue linking – more than has thus far been the case. In specific terms we propose that countries or country coalitions consider aspects from related policy processes in their climate strategies, including broader side-payments and package deals.

One of the novel developments of climate governance has been the creation of carbon markets to make emission reductions for private parties more cost-effective. Here we explore specific dilemmas surrounding two key mechanisms in use to date, the Clean Development Mechanism and emission trading schemes. When reforming the CDM to account for its main problems (unequal geographical distribution, lack of sustainable benefits, complex bureaucracy), a balance must be struck between different interests. With respect to emissions trading, a major problem is how to link the different schemes that are in place or under development. While a top-down approach might offer greater environmental effectiveness, a bottom-up approach is more likely to emerge since it may politically more feasible.

The final section in this Policy Brief addresses the emerging need for a global governance system on adaptation to climate change. Climate adaptation is becoming a reality of world politics in the 21st century. The required level of adaptation may exceed the institutional capacities of many nations, which raises questions as to what institutions are in need of redesign and strengthening and to what

extent new institutions and governance mechanisms are required. Little research exists in this domain. Our work outlines carefully drafted proposals for additional institutions that focus on climate-induced refugees and the assurance of food security.

2. Introduction

The year 2009 will mark a crucial juncture in the evolution of the global climate regime: in 2012, the commitment period of the Kyoto Protocol will expire. By all expectations, in order to enter into force on time, a new agreement for the next period will have to be decided upon at the 2009 conference of the parties to the United Nations Framework Convention on Climate Change in Copenhagen. Yet, given the current disagreement between major industrialised countries – notably the United States, Russia and the European Union – and between industrialised and developing countries, reaching agreement by 2009 would appear to be a tall order. At present, it is still far from certain that governments will be able to agree upon a post-Kyoto ‘Copenhagen Protocol’.

The European Union is seen as a crucial actor in this process. As a major emitter with a relatively climate-concerned population, and as a region with a strong emphasis on multilateralism and global co-operation, the EU seems well positioned to play a major role in brokering a global deal. And yet, how this compromise can eventually be reached remains unclear.

The issues at stake in current negotiations are too multifarious to be addressed in one paper. This fifth¹ ADAM-CEPS Policy Brief thus focuses on three issues that the ADAM project believes are especially important in the long-term development of the climate regime. These core policy issues are the challenge of *fragmentation* of negotiations and governance systems; the challenge of steering and evaluating novel types of *privatised and market-based governance* mechanisms; and the challenge of designing architectures for *global adaptation governance* in the absence of any precedence. By and large, these three core issues of fragmentation, privatisation and adaptation can be related to the overarching need to define the *architecture* of the

¹ The first three ADAM-CEPS policy briefs are based on discussions during a science-policy seminar held at CEPS on 1 October 2007 in the context of the European Commission Green Paper on Adaptation: “Why we will need adaptation and how it can be implemented” (Aaheim and Aasen, 2008; Aaheim et al., 2008; McEvoy et al., 2008). The fourth ADAM-CEPS policy brief is based on a science-policy seminar held at CEPS on 4 April 2008 on “The future of European electricity: choices before 2020” (Eskeland et al., 2008).

post-2012 regime – and of any subsequent regimes that may follow a Copenhagen agreement.

The first challenge – fragmentation of negotiations and governance systems – refers to larger developments in climate governance in recent years that have become a major concern for decision-makers and observers alike. Examples are efforts of the US to create parallel international fora for climate policy (e.g. Asia-Pacific Partnership, Meeting of Major Economies). However, fragmentation is not per se disadvantageous. More diverse institutional systems could lead to better policy outcomes by allowing for innovation and the diffusion of novel ideas. The relative advantages and disadvantages of fragmentation of climate governance are thus a question for analysis that we address in section 3 of this Policy Brief.

Second, climate governance is among all international environmental policy domains the one where market-based mechanisms and the role of the private sector are strongest. A core question is the effectiveness of these new mechanisms – do they deliver the emissions reductions that are needed to reach environmental goals? Equally important are other effects of market-based mechanisms and the involvement of industry: what are their allocative effects in terms of distribution of income between different industries, but also between nations, notably between north and south, and between different southern countries? Also crucial are questions of democratic accountability and legitimacy of these new arrangements. These questions we address in section 4 of this Policy Brief.

Third, this paper ventures to explore an emerging issue that has not yet reached its full potential within the post-2012 negotiations: the outline of a global governance system for the adaptation to climate change. Climate change might well require a level of adaptation that exceeds the capacities of most nations, and that makes adaptation to climate change one of the core issues of world politics in the 21st century – including global security policy. Section 5 of this Policy Brief presents two policy recommendations that have evolved from this research: the proposal to negotiate a UNFCCC Protocol on the Recognition, Protection, and Resettlement of Climate Refugees, and a proposal to negotiate a UNFCCC Adaptation Food Security Protocol.

3. Addressing institutional fragmentation

The term ‘institutional fragmentation’ describes situations of overlapping international norms and institutions – with different legal status, constituencies, spatial scopes or predominant

subject matters – in one issue area. We use this term – which is widely employed in legal research (Hafner, 2004; Koskenniemi and Leino, 2002) – without negative or positive connotation. In climate governance, fragmentation extends to different spheres, from the fragmentation of ‘purely’ climate-specific institutions towards a broader fragmentation between climate institutions and regimes and organisations with universal or cross-issue portfolios. In the ADAM programme, we have researched advantages and disadvantages of such institutional fragmentation with regard to the environmental, economic and social effectiveness of climate governance. While institutional fragmentation may have some benefits, serious disadvantages can arise, for instance from gaps in co-ordination (for more details on our methods and findings, see Biermann et al., 2007; Boeters et al., 2007; Hof et al., 2007).

Based on these results, there are various policy options to enhance cross-institutional co-ordination on climate change. Of specific importance is the overlap between the UN climate regime and the WTO. This overlap affects several core elements of the climate regime. For one, there are material interlinkages between the goals of both regimes (that is, climate change and climate policies affecting trade, trade and trade liberalisation affecting climate change). In addition, there are various overlapping policy processes in the UN climate regime and the WTO (see for instance Asselt and Biermann, 2007; Biermann and Brohm, 2005; Brewer, 2004; Zelli, 2007). Topics that fall into this overlap between both regimes include trade in emission allowances,² unilateral policies and measures (e.g. border cost or border tax adjustments, subsidies, and technical standards), and

² Collision with GATT or GATS rules is not likely for the primary carbon market, i.e. trade in allowances by end-users, since emission permits are neither goods nor services. However, there might be overlaps for the secondary market, i.e. trade in derivative financial instruments based upon allowances: “If the ETS rules allow financial-service providers to buy, own, and hold allowances, the EC and its Member States may be under a GATS obligation to extend MFN and national treatment to foreign services and service suppliers” (Werksman, 2001, p. 171). Depending on the design of the ETS, especially on the point of a carbon-based fuel cycle, at which allowances are required, the trading scheme could run counter to WTO provisions. This holds especially for upstream allocations requested from energy producers, since, whenever exporting their energy to another ETS country, such allocations would be equal.

transfer of climate-friendly goods, services and technologies.³

While the potential legal overlaps between the UN climate regime and the WTO on these issues have been the object of extensive academic discussions, there are also political overlaps, that is, parties are discussing these issues in both regimes. To a certain extent, the UN climate regime and the WTO have reached a division of labour. For instance, the WTO discusses trade barrier removals for environmental goods and services, while the climate convention negotiations address technology needs of developing countries. This notwithstanding, the EU early on called for discussions and negotiations on the relationship between the WTO and international environmental regimes. These discussions, which also touch upon climate-related issues, are mostly taking place in the WTO Committee on Trade and Environment (CTE).⁴

The choice of the forum where such overlapping issues are discussed is sensitive. The IPCC Third Assessment Report directly refers to this problem in questioning whether the CTE is the “appropriate forum to resolve these questions [of trade measures for environmental purposes]” (IPCC, 2001, p. 435). Moreover, climate-related discussions in the WTO are often held hostage by larger debates. For instance, no permanent WTO observer status has been granted to the climate convention, mainly because of objections from members of the Arab League. Likewise, WTO negotiations on the removal of trade barriers for environmental goods and services have not significantly advanced, as several countries wait for an outcome of the Doha negotiations on farm subsidies. Moreover, discussions on climate-trade overlaps outside of the WTO have been limited to certain ministries, for example trade ministers at the 2007 Bali meeting, or

³ Another much-debated overlapping issue is bunker fuels, especially plans to include international aviation in the EU-ETS. However, this overlap does not involve the WTO, but the International Civil Aviation Organization (ICAO). The EU Commission has proposed that, at the start of 2012, the EU-ETS shall be expanded to cover emissions from all international flights – from or to anywhere in the world – that arrive at or depart from an EU airport. In its response, the US government has considered these plans as unlawful under the Chicago Convention on Civil Aviation of 1944, which is administered by the ICAO. In September 2007, the US Ambassador to the EU, Boyden Gray, even considered a lawsuit should the EU further pursue its plans (Brewer, 2008, p. 15).

⁴ For the Doha Round in 2001, key discussions on environment-trade overlaps take place in the Special Session of the CTE (CTE-SS).

environmental ministers during climate negotiations.

In a joint workshop with the Economics and Trade Branch of the UN Environment Programme, the ADAM team has discussed these deadlocked debates and climate-trade-overlaps with chief experts, non-state representatives, and policy-makers from the UN, the WTO, and governments. Three issues stood at the centre:

1. On the level of international institutions, the need to bring in further expertise to inform discussions on climate and trade;
2. On the level of intergovernmental co-ordination, the need to broaden dialogues across institutions to overcome negotiation deadlocks; and
3. On the level of governments, the need to integrate strategies on related problems.

As for the first point, experts agreed that current discussions on the climate-trade overlap focus too much on border cost adjustments. While the EU and recent bills discussed in the US Senate consider such measures, there is still high uncertainty about their implications for domestic and foreign industries, but also with regard to mitigating climate change. As for their climate-related effects, for instance, border cost adjustments cannot address all leakage-related concerns, and also do not directly create incentives to reduce greenhouse gas emissions in exporting countries. Some experts even hold that border cost adjustments could amount to discrimination for the protection of locally protected goods, and that they “could be seen as coercing countries to accept ambitious CO₂ reduction commitments” (Quick, 2007, p. 174). A predominant focus on border cost adjustments as a panacea might lead to a patchwork of unilateral regulations, while missing other chances to address carbon leakage concerns, for example by providing positive mitigation incentives. In light of these caveats and the uncertainty on border cost adjustments, it is crucial to strengthen expert advice (see section 6.1 for more detailed proposals).

Regarding the second and third points above, governments should further explore opportunities for cross-issue co-ordination. Such co-ordination can be furthered at the intergovernmental level, in the form of a cross-ministerial dialogue (see section 6.1). Another way is to further co-ordinate or integrate strategies at the domestic level, that is, across ministries within one government. This idea of strategic issue linking implies that countries or country coalitions consider aspects from related policy processes in their strategies. Based on such integrated strategies, countries or country groups can reinvigorate discussions at the international

level, for example by tabling proposals for co-ordination, side-payments or even package deals (see Cesar and De Zeeuw, 1996; Folmer et al., 1993; Zürn, 1990, pp. 166-73).

Such agreements are not uncommon in international politics in general and international trade in particular, and they have been included in recommendations of IPCC reports (IPCC, 2001, pp. 624-627). The most noteworthy example of a link between climate and trade interests is Russia's ratification of the Kyoto Protocol in early November 2004 – which secured the Protocol's entry into force 90 days later. With this step, Russia's President Putin followed recurrent requests by EU member countries that had made their support for Russia's WTO accession contingent upon Moscow's ratification of the Kyoto Protocol (Henry and Sundstrom, 2007; Kotov, 2004, p; 158ff.).

Yet package deals are no panacea. While the potential number of issue linkages between climate and trade is very large, most are neither feasible nor sensible. Caveats to consider include:

- *Forum.* Linking issues raises questions about institutional mandates and jurisdiction. Not all actors may consider the CTE or other WTO committees as the appropriate forums to discuss climate-related issues. The choice of forum where such linkages are first discussed needs to accommodate such concerns.
- *Nature of Issues.* As climate negotiations provide a public good, that is, a good with non-excludable benefits, incentives are high to free ride. To reduce this, issue linking is sensible especially in negotiations on issues with excludable benefits, for example deals on technology transfer.
- *Country Positions.* The agendas of both post-2012 climate governance and the Doha negotiations are overburdened, which slows down progress (ICTSD, 2008). Additional topics could hence easily make matters worse. The choice of topics therefore needs to guarantee balanced benefits for all parties. Moreover, in the Doha Round, trade topics tend to be more important to parties than climate concerns. This imbalance of preferences needs to be taken into account.

Bearing these caveats in mind, we have explored two possibilities of integrated issue-linking strategies. These strategies are listed in section 6.1, along with other suggestions for broadening the debate on the overlap between climate and trade.

4. Market-based mechanisms

Despite current disagreements over the details of a post-2012 climate policy architecture, carbon markets are a central feature in most proposals on how to move society towards a low carbon economy. With over ten years passing since the negotiations in Kyoto, it has become evident that Kyoto was crucial in 'putting a price on carbon' and thereby channelling clean energy investments around the world. However, the exact role and relevance of market-based governance schemes for climate change mitigation in any post-2012 agreement is still largely unclear.

Carbon markets do not emerge spontaneously but have to be crafted by political decisions. Governmental agreements are needed for generating both the supply and the demand for carbon dioxide reductions. The main trend in climate governance has been the creation of carbon markets in order to make emission reductions more cost-effective. Carbon markets work on the premise that carbon emissions (including information about carbon emissions) can be treated as a tradeable commodity. Central to the process of carbon 'commodification' is a set of rules for participation, allocation and credit generation including monitoring, reporting and verification as well as knowledge about actors, emissions, baselines, behaviour and additionality of emission reductions.

There are two main systems by which the underlying commodity (usually the permit to emit a ton of carbon dioxide equivalents) is created: cap and trade systems and baseline and credit systems. A cap-and-trade market is created when a collective of emitters within a certain jurisdiction receive a 'cap' on their emissions. Within that cap, emitters are allowed to trade the allowances between themselves. In a baseline-and-credit market, the carbon credits are equal to the difference between emissions after emission-curbing measures vis-à-vis the baseline (emissions with business as usual). The cap and the baseline, respectively, are essential in the commodification process. We can further distinguish between compliance markets, which result from public regulation (e.g. the Kyoto Protocol or national emission trading schemes), and voluntary markets, which do not rely on public regulation to generate demand. Compliance markets as well as voluntary markets might be designed as cap and trade systems or as baseline and credit systems. These distinctions result in the following typology (see table below). Our research has investigated two specific mechanisms – the Kyoto Protocol's Clean Development Mechanism and emissions trading – with a view towards existing structural and institutional shortcomings and potential reform options.

Carbon markets	Compliance market	Voluntary market
Cap and trade	Kyoto Emissions Trading EU ETS New South Wales RGGI, WRCAI Individual Carbon Trading (not yet implemented anywhere)	Chicago Climate Exchange (CCX)
Baseline and credit	CDM, JI	Voluntary Carbon Offsetting

4.1 Clean Development Mechanism

Within the Kyoto Protocol, the CDM allows industrialised countries to generate emission credits through investment in emission reduction projects in developing countries. The CDM aims at providing low-cost emissions reductions to Annex 1 countries, while at the same time facilitating technology transfer, increase the flow of capital from rich to poor countries, and to provide sustainable development in developing countries. Because the role of developing countries in a future climate regime is a major issue in climate negotiations, the CDM becomes crucial since it is the only part of the Kyoto Protocol that provides an active role for developing countries. However, this linking of delivering cost-efficient reductions and providing development assistance has come under criticism. Current discussions highlight the potential trade-off between implementing the CDM in middle-income countries that have the adequate technical and knowledge infrastructures to deliver successful projects and the political goal of making the CDM more inclusive.

As a market, the CDM seems to be able to provide significant volumes of emission reductions for industrialised countries. In May 2008, there were 3498 CDM projects under validation and registration in the CDM project pipeline. In 2007, 551 million tonnes of carbon dioxide equivalent to 7426 million US\$ were managed under the CDM. The current project pipeline has the capacity to reduce 2500 million tonnes of carbon dioxide equivalent and the CDM may have generated around 1000 millions of Certified Emission Reductions by 2012. The average price of a CER was between €10 (money upfront) and €17 (paid on delivery). Despite this relative success in terms of market indicators, climate governance through the CDM is contested, in particular based on the observation that it is unevenly spread across the globe. Three countries (China, India and Brazil) account for two thirds of the projects and as regions, Latin America and the

Asia and Pacific region host 96% of the projects. Africa has earlier been bypassed in the CDM investments flows, but has now somewhat risen to hold a market share of 5% of transacted volumes of Certified Emission Reductions even though the number of projects (74) is still rather low. In the years to come there is uncertainty about the space in which offsets could operate. Without targets of over 30% reductions in industrialised countries there is no real role for the CDM to play.

With regard to the CDM, it is important to always keep an eye on ‘why we have the CDM’ and if the CDM is moving us any closer to the global reduction of greenhouse gases. The CDM has been subject to a critical academic and political debate during the last few years. Most assessments have come to rather moderate evaluations. These studies acknowledge that the CDM is working quite well in terms of its ability to provide Certified Emission Reductions, but also highlight problems such as (1) the unequal geographical distribution of projects, (2) the lack of sustainable development benefits from many projects and (3) a complex bureaucratic process. We conclude that the market structure of the CDM and the resulting focus on cost-efficient emissions reductions are at the root of the problem. However, it is interesting to note that among some of the more developed host countries (e.g. Chile); CDM credits are treated as just another export product, while the lack of sustainable development benefits from projects is not seen as an issue.

Recently, the question of additionality has moved up the agenda again. According to the Kyoto Protocol, emission reductions generated by the Clean Development Mechanism must be additional to those that would otherwise occur. Additionality is established when there is a positive difference between the emissions that occur in the baseline scenario, and the emissions that occur in the proposed project. Yet several authors have now questioned the way additionality is assessed. Michaelowa and Purohit (2007) argue that the information provided in the project design document in many cases is insufficient for assessing additionality in a transparent way, and that the packaging of information also seems to affect the result of the additionality test. Schneider (2007) contends that it is likely that “a significant amount of registered projects” are non-additional. Suspicions like these might bring the environmental integrity of the CDM into doubt, and are thus to be dealt with urgently if the CDM is to be carried forward into a new phase of the climate regime. However, it should be noted that designing an additionality test is in the end an optimisation problem: a balance has to be struck so that not too many non-additional projects are allowed under the

CDM, and not too many truly additional projects are ruled out.

Most authors anticipate that the CDM will be a part of the climate regime also post-2012 (Streck and Lin, 2008), perhaps in combination with more flexible levels of commitments so that some developing countries are able to take on binding commitments (Christiansen, 2004). But what are the existing options? Some scholars suggest that the CDM should be reserved for the least developed countries (Lecocq and Ambrosi, 2007). It is likely that the CDM will change when a new post-2012 climate governance architecture is agreed upon. There are many ideas on the table for scaling-up the current project-based CDM to 'programmatic CDM' (to allow many project activities to become part of one large CDM project), 'sectoral CDM' (to credit vis-à-vis a sectoral baseline) or 'policy CDM' (to allow an activity that falls under a government policy to claim credits) in order to generate larger amounts of emission reductions as well as enabling the CDM to better facilitate societal transformations to low carbon emission trajectories. In the discussions on the role of CDM post-2012, the idea of a sectoral CDM is frequently brought forward. Sectoral CDM is seen as promising since it is assumed to contribute to the structural changes necessary to promote the long-term mitigation of GHG emissions in developing countries, and could also make projects with larger sustainable development benefits viable under the CDM (Sterk and Wittneben, 2006). However, an up-scaled CDM, whether in the form of a sectoral approach or not, requires new arrangements both for assessing additionality and for calculating emission reductions. It remains to be seen how these suggestions will fit the overarching direction of international climate policy.

4.2 Emissions Trading

A second challenge for designing market-based post-2012 governance architectures is further developing international emissions trading. Economically, a global emissions trading system with a single price for greenhouse gases in all sectors and world regions would be the most efficient quantity instrument for mitigating climate change. There are, however, different roads to establishing such a global system.

Top down approaches aim at implementing emissions trading at the government level through multilateral negotiations, while leaving the domestic implementation to participating countries. In an ideal case, every country in the world would adopt a cap, resulting in a comprehensive global emissions trading system. Such a global carbon market may be part of a global deal on mitigating climate change in

the long run. However, several world regions are reluctant to assume binding caps for fear of adverse impacts on their economic growth. Despite this reluctance the EU put its emissions trading scheme in place in 2005. The Kyoto trading system introduced binding caps for developed Annex-I countries (rejected however by the US) and introduced the CDM offsetting mechanism for integrating developing countries into the global carbon market.

Bottom up approaches emphasise the implementation of domestic emissions trading systems by governments on the national or sub-national level. Currently, domestic emissions trading systems are emerging all over the world. On the federal level New Zealand, Australia, Switzerland, the US, Canada, and Japan are considering or implementing trading systems. On the sub-national level, systems are in the process of planning or implementation in the Regional Greenhouse Gas Initiative, in California, in the Western Climate Initiative, and the Midwestern Greenhouse gas Accord in North America, and the Tokyo and Kyoto municipalities in Japan.

Regarding the international integration of such domestic schemes, there are broadly three options. First, domestic emissions trading systems may remain unconnected. However, there will still be indirect linkages via international energy markets. Second, domestic emissions trading systems are linked indirectly if they commonly accept certain credits for example from CDM, which will lead to some price convergence. Third, domestic ETS are formally linked if they mutually accept their allowances for compliance.

When formally linking different trading systems, the environmental and economic integrity of the resulting joint system needs to be ensured. In particular, design features with an impact on allowance prices and quantities and fundamentals such as well-designed monitoring and verification systems and compliance provisions need to be analysed with care (see Flachsland et al., 2008a). Also, linkages should be assessed against the background of the 2°C target of the European Union (EU Council, 2007). If the US were to implement a domestic emissions trading system, the creation of a transatlantic carbon market by linking such a system to the EU ETS could send out a strong signal for the further development of the international carbon market. The Asia Pacific region with emerging trading systems in New Zealand, Australia and Japan is another important prospect for linking the EU ETS (for more details on the options of linking see Flachsland et al., 2008b; for a discussion of the prospect for linking emerging regional trading

systems to the EU ETS, see Flachsland et al., 2008a).

Because of their inclusiveness, top-down approaches tend to cover a larger share of global emissions and thus offer a higher degree of environmental effectiveness than bottom-up approaches. However, a significant share of global emissions could also be captured by means of a decentralised approach, in which a carbon market is created by linking existing domestic or regional ETS. The environmental effectiveness of both approaches can be enhanced by integrating baseline-and-credit schemes, for example the CDM of the Kyoto Protocol.

If emissions price equalisation is the sole criterion, top-down approaches also fare better in terms of economic effectiveness. But if plausible market imperfections associated with emissions trade between governments (such as market power or information asymmetries) are taken into account, price equalisation is unlikely to be a sufficient criterion for efficiency, which requires the equalisation of marginal abatement costs. Bottom-up approaches, based on pre-existing trading systems between companies, provide a more robust price signal, and can be very efficient once they are 'linked'.

High political feasibility emerges as the main strength of bottom-up approaches, and, at the same time, the biggest hurdle for top-down architectures. For the latter, international agreement on burden sharing constitutes a key requirement. By contrast, the former lends itself to the formation of a coalition-of-the-willing with subsequent enlargements. It can be concluded that the perhaps intuitive view of bottom-up and top-down approaches as (imperfect) substitutes needs to be amended. In as much as bottom-up trading architectures bring about not the optimal, but the feasible, they remain a second-best alternative to a top-down global cap-and-trade system in terms of environmental effectiveness. However, when viewed as building blocks that allow putting a cost-effective and expandable carbon market into place without further delay, their supportive role in the eventual establishment of a global carbon market becomes apparent.

5. Towards Global Adaptation Governance

The need to mitigate climate change has until very recently dominated the debate on global environmental governance. Now it becomes evident that mitigation efforts have been too little and too late. Climate change adaptation has thus become a reality of world politics in the 21st century. This

situation requires a new, additional focus in both academic research and policy planning: How can we build systems of global governance over the course of the next decades that will cope with the global impacts of climate change? What institutions are in need of redesign and strengthening? To what extent, and in what areas, do we need to create new institutions and governance mechanisms from scratch?

Not much policy research on these questions is available. In light of the most recent scientific findings, which indicate possibly accelerating climatic change, there is thus an urgent need for a new academic research programme on what we propose to call 'global adaptation governance'. Global adaptation governance will affect most areas of world politics, including many core institutions and organisations of current global governance. The need to adapt to climate change will influence, for example, the structure of global food regimes and the work of the UN Food and Agriculture Organization; global health governance and the agenda of the World Health Organization; global trade in goods whose production will be harmed or helped by climate change; the world economic system and the ability of the International Monetary Fund to address climate-related shocks to national and regional economies; the World Bank and bilateral and national agencies in raising and distributing funds to support adaptation; as well as many other sectors from tourism to transportation or even international security.

Two of the most crucial governance needs, we argue, are the plight of 'climate change refugees', or 'climate refugees' in short, as well as the global governance of food production and distribution.

Regarding climate refugees, it is likely that climate change will fundamentally affect the lives of millions of people who will be forced over the next decades to leave their villages and cities to seek refuge in other areas. Although the exact numbers of climate refugees are unknown and vary from assessment to assessment depending on underlying methods, scenarios, timeframes and assumptions (Biermann and Boas, 2008, and forthcoming), the available literature indicates that the climate refugee crisis will surpass all known refugee crises in terms of the numbers of people affected. Many climate refugees may seek refuge in their own countries; others will need to cross borders to find a new home. Some local refugee crises, in particular in the richer countries in the north, may be prevented through adaptation measures such as reinforced coastal protection or changes in agricultural production and water supply management. Many poorer countries, however, are unlikely to be able to initiate sufficient adaptation programmes, and

climate-induced migration might be the only option for many communities in the south. In these situations, climate refugees will need to rely on effective protection and support from the international community, regardless of whether climate migration will be internal or transnational.

It is apparent from our research that the current refugee protection regime of the United Nations is poorly prepared. At present, the United Nations High Commissioner for Refugees deals with merely ten million refugees. It is doubtful whether this institution can protect and support, without major reforms, a stream of refugees that is possibly twenty-times larger. The UN High Commissioner does not even have a legal mandate to protect people who flee their homes because of climate change. Instead, this mandate covers only individual political refugees who flee their countries because of state-led persecution based on race, religion, political opinion, or ethnicity. Climate refugees fall outside the mandate.

At a meeting in the Maldives in 2006, delegates therefore proposed an amendment to the 1951 Geneva Convention Relating to the Status of Refugees that would extend the mandate of the UN refugee regime to cover also climate refugees. Yet such an amendment, we argue, leads us in the wrong direction. It does not promise to effectively resolve the emerging climate refugee crisis. To start with, the political feasibility of this proposal is highly uncertain. Already today, the UN refugee regime is under constant pressure from industrialised countries that seek restrictive interpretations of its provisions. It is unrealistic that governments will extend the same level of protection to twenty-times more climate refugees, which is equal in numbers to half the population of the European Union. It is also highly doubtful whether the current institutional apparatus of the UN High Commissioner for Refugees, and the personalised refugee regime under the Geneva Convention, would be able to effectively protect and support a much larger stream of climate refugees.

More importantly, the proposal of an extension of the UN refugee regime misses the core characteristics of the climate refugee crisis. Climate refugees do not have to leave their countries because of a totalitarian government. In principle, they still enjoy the protection of their government and their country. The protection of climate refugees is therefore essentially a development issue. It requires large-scale, long-term planned resettlement programmes for groups of affected people, mostly within their country. Often this will be in concert with adaptation programmes for other people who are not evacuated but can still be protected, for instance through strengthened coastal defences. It is

therefore not the UN High Commissioner for Refugees but other international agencies such as the UN Development Programme or the World Bank that are called upon to deal with the emerging problem.

We argue therefore for a separate, independent legal and political regime: a Protocol on the Recognition, Protection, and Resettlement of Climate Refugees (“climate refugee protocol”) to the United Nations Framework Convention on Climate Change (see in more detail Biermann and Boas, 2008, and forthcoming). We propose five core principles for such an agreement (Biermann and Boas, forthcoming). The first principle is that at its core must not be programmes on emergency response and disaster relief, but *planned and voluntary resettlement and reintegration* over periods of many years and decades. Spontaneous flights, as in the case of political turmoil or war, can then be avoided. The second principle is that climate refugees must be seen, and treated, as *permanent immigrants* to the regions or countries that accept them. Climate refugees cannot return to their homes, as political refugees can (at least in theory). The third principle is that the climate refugee regime must be tailored not to the needs of individually persecuted people (as in the current UN refugee regime), but of *entire groups of people*, such as populations of villages, cities, provinces or even entire nations, as in the case of small island states. Fourth, an international regime for climate refugees will be targeted less at the protection of persons outside their states but rather at the support of governments, local communities, and national agencies *to protect people within their territory*. The governance challenge of protecting and resettling climate refugees is thus essentially about international assistance and funding for the domestic support and resettlement programmes of affected countries that have requested such support. Fifth and finally, the protection of climate refugees must be seen as a *global problem* and a *global responsibility*. In most cases, climate refugees will be poor, and their own responsibility for the past accumulation of greenhouse gases will be small. By a large measure, the rich industrialised countries have caused most emissions in the past and at present, and it is thus these countries that have most moral, if not legal, responsibility for the victims of global warming. This does not imply the transnational migration of 200 million climate refugees in the north. Yet it does imply the responsibility of the industrialised countries to do their share in financing, supporting, and facilitating the protection and the resettlement of climate refugees.

The climate refugee protocol that we propose will not create new international bureaucracies. Instead,

the resettlement of millions of climate refugees over the course of the century will be the task of existing agencies. Given the complexity of climate-related flight, the best model will be to mandate not one single agency but rather a network of agencies as ‘implementing agencies’ of the protocol.

Coupled with the issue of climate migration and perhaps a key determinant that could potentially drive people from their homes, villages, and countries is access and ability to produce sufficient amounts of safe and nutritious food. Enabling communities to domestically produce their own food for greater food security has long been on the agenda of international development agencies. Nevertheless, the UN estimates currently that nearly 800 million people live in food insecure environments. While the causes of food insecurity cannot solely be attributed to fluctuating environmental conditions, there are a number of socio-economic and natural stressors to food systems that lead to food insecurity. A changing climate will have a significant impact on many already stressed communities. Agricultural research suggests that with a global rise in temperature, many staple cereal crops could be negatively affected due to heat and water stress. The three key impacts for agriculture are a depletion of ground water, reduced precipitation and changes – primarily a shortening – of the growing season, all which have the potential to reduce output yields. The IPCC Fourth Assessment Report suggests that with a 2 to 3 degree range of warming, by 2020 agricultural yields in Africa could decrease by as much as 50%. Other global agricultural climate models show that by 2080 there could be a significant decrease in maize, wheat, rice, soybeans and millet worldwide, especially in Latin America, South Asia and Africa. Conversely, some of these models show that at least by 2020 with 2 to 3 degrees of warming in northern climates such as those in Europe and North America, outputs of staple crops could increase.

Given this expected shift in productivity, some form of adaptation must occur to ensure greater food security in regions that will be most vulnerable. The ADAM research has explored here what type of global governance systems would be most appropriate to facilitate adaptation for greater food security. So far, our research indicates that there needs to be a mechanism that allows for adaptation at the local level to help farmers and communities and at the same time ensures that there is a well functioning institutional system at the global level that supports the financing and implementation of adaptive measures, including improved farming techniques and technologies.

6. Policy options and recommendations

6.1 *The overlap between climate and trade policies*

In Section 3 we discussed major approaches to leverage negotiations on trade-related climate policies. Here, we focus on the policy options and recommendations that follow from our research.

First, on the level of international institutions, it appears important to bring in further expertise to inform discussions on climate-trade issues and to move discussions away from mostly considering unilateral trade measures. One topic for which further expertise is needed is border cost adjustments. Our research indicates that the first-best option is still a comprehensive climate agreement in which most countries accept binding (yet differentiated) commitments. Yet such a regime might not emerge soon, to the effect that some governments, including the European Union, have embarked on a discourse on border cost adjustments. Yet our research indicates that current knowledge is insufficient to understand the potential effects of such measures. It is thus crucial to first gather more evidence on the implications of border cost adjustments, including climate- and trade-related effects, chances to discipline such measures in multilateral agreements, and indirect impact on climate negotiations (for example in light of perceptions by developing countries). Such evidence could be provided, for instance, by a separate chapter on unilateral and multilateral trade-related approaches in the Fifth Assessment Report of the IPCC.

In the case that some governments opt for border cost adjustments unilaterally, such measures must build on an adequate scientific basis, that is, an adequate accounting system that tracks the carbon embedded in products. In addition, too pragmatic border cost adjustments systems that do not account for indirect inputs, such as electricity inputs, should be avoided. Limited border cost adjustments regimes cannot address leakage concerns in sectors where emissions largely result from electricity consumed in the production process, such as aluminium). One option to address the trade-off between pragmatism and accuracy could be a flexible system: one could start with default values of embedded carbon, and then give importers the chance to challenge the value for their respective product by providing new evidence. In the long run, such a flexible default-value system might even form the basis for a multilateral agreement, although this does not seem politically feasible today.

A flexible expertise-based approach might also be an option suitable for another major issue of

climate-trade overlap, the removal of trade barriers for climate-friendly goods and services. Instead of a fixed list of climate-friendly or environmental goods and services, the EU could propose a 'living list', which can be amended based on further scientific input.⁵ For instance, building on carbon life-cycle analyses of goods and services, sustainability criteria for the removal of trade barriers could be developed. Such criteria could also refer to CO₂-related standards, which the International Standardization Organization (ISO) is developing. With regard to the transfer of climate-friendly technologies, another source of information to be considered are the Technology Needs Assessments that non-Annex II countries submit to the secretariat of the climate convention. Finally, further expert advice is needed on the role of intellectual property rights for the transfer of low-emission technologies.

As regards intergovernmental co-ordination, it also appears important to broaden the dialogue across institutions to overcome negotiation deadlocks. One option for the EU is to initiate regular meetings between representatives from environmental, trade and development ministries. A crosscutting dialogue could help circumvent deadlocks in the WTO Committee on Trade and Environment. Moreover, regarding political sensitivities about the appropriate forum, such a dialogue could provide a platform to discuss overlap questions outside of the WTO. However, it seems important to arrange the dialogue across ministries instead of continuing the practice of separate meetings (such as the meeting of trade ministers during the last COP in Bali).

Concerning strategic issue-linkages, there are two possibilities, depending on the level of ambition. More ambitious issue linking could connect broader policy objectives. An example of such an approach is the package deal around Russia's ratification of the Kyoto Protocol. Such linkages are often initiated by high-level government officials *ad hoc* depending on the current political situation. It is important for EU representatives to stay alert and explore similar opportunities, possibly also again with Russia.⁶ Possible high-level forums to discuss

⁵ In discussions under DDA para. 31(iii) in the Doha Round, the EU and the US have proposed a list of environmental goods and services for which they demanded trade liberalisation. In addition, in a separate proposal that they tabled outside the Doha Round, the EU and the US have provided a more specific list of climate-friendly goods and services (based on a World Bank study).

⁶ For example, the EU could try to intensify its co-operation on climate and energy with Russia, and possibly other countries like the Ukraine. The Russian economy has great potential for enhancing its energy efficiency and renewable energy. The EU, with its

package deals are the G8, whose 2007 summit on a range of issues already gave a significant boost to UN climate negotiations, or the cross-ministerial dialogue we suggested earlier in this section.

A more common type of issue-linking is to integrate country strategies, based on regular co-ordination, consultation and information exchange among representatives of a government, for example country negotiators in different forums of the climate convention. In the EU, such co-ordination is built on the Brussels-based working group of the Council, supported by several expert groups, which prepares international negotiations and agrees on negotiating positions which are then often reflected in Council conclusions (Oberthür and Roche Kelly, 2008, p. 38).

However, climate negotiations are already very complex and overburdened, and the building blocks for the Copenhagen Agreement imply an extensive linkage of different issues. We therefore suggest looking into possibilities to integrate strategies on climate-related debates within the WTO Doha Round. We offer two examples for which it might be feasible to further integrate country strategies in the Doha Round: first, the EU could consider linking its position on the relationship between the WTO and multilateral environmental agreements under DDA para. 31(i) to its position on the TRIPS agreement. In the former debate, the EU has asked for legal concessions under WTO law in favour of trade-related measures under multilateral environmental agreements, however meeting opposition from developing countries who fear green protectionism. But in the second debate, some developing countries have demanded concessions in favour of specific environmental concerns: Brazil, India and other countries have called for an amendment of the TRIPS Agreement to reflect requirements of the Convention on Biological Diversity, in particular regarding the access and benefit-sharing of plant genetic resources. Moreover, some developing countries have asked for TRIPS exemptions to facilitate the transfer of climate-friendly technologies under DDA para. 31.iii. With all these debates concerning some form of legal concessions under WTO law, there is potential for strategic issue linking: for instance, movement from one side on the debate between WTO and multilateral environmental agreements could trigger progress in TRIPS-related discussions.⁷

technological know-how, could be a possible partner to explore this potential.

⁷ Currently, such an issue-linkage might not be fully possible, since the constellation of countries is not

A second option for issue linking are overlapping discussions on environmental goods and services, and biofuels. In the Doha Round, under DDA para. 31.iii, the US and the EU have requested developing countries to liberalise trade policies to allow more transfers of environmental goods and services. Brazil and other developing countries have criticised the fact that the list of environmental goods and services presented by the EU and the US does not feature biofuels. Moreover, Brazil has included US subsidies of biofuels in a dispute it filed in the WTO in 2007 (Brewer, 2008, p. 24).⁸ In light of this overlap, concessions from one or both sides on biofuels might help reinvigorate the debate on environmental goods and services. Such a concession could for instance come close to the idea of a ‘living list’ which could include biofuels that fulfil certain sustainability criteria. This consideration of sustainable biofuels would accommodate the interests of some developing countries and raise the chances of a more comprehensive deal on trade barrier removals for environmental goods and services.

6.2 Market-based mitigation mechanisms

Regarding the marketisation and privatisation of climate governance, a number of preliminary policy recommendations can be derived from ADAM research.

Geographical Inequity: First, to address the inequitable regional distribution of CDM projects, increased institutional-capacity building efforts are

perfectly matching across these debates. For instance, in discussions under DDA para. 31(i), the EU faces rather steadfast opposition from all other countries, while in TRIPS Council discussions, the EU is much closer to the developing country position than the US. This notwithstanding, Switzerland and some EU countries have already demonstrated that some form of issue-linkage with regard to TRIPS discussions is possible; in order to reach a package deal, they suggested linking their demand for an extension of provisions on geographical indication to the proposal on a TRIPS amendment on disclosure (as required by developing countries).

⁸ The lack of internationally agreed criteria for sustainable biofuels production and the uncertainty about the legal status of biofuels equally concern the farm subsidies debate. Thus far, fuels made from crops, such as ethanol, are classified as agricultural goods (by the World Customs Organisation), while biodiesel is considered to be an industrial product (cf. Motaal, 2008). Subsequently, biofuels are discussed at different ends of the Doha debate. One possibility could be to only define biofuels as industrial goods and then predominantly discuss them in the para. 31(iii) debate.

needed in many parts of the world. Another option is to stop dealing with all developing countries in a uniform approach. It makes sense to expect different things from LDCs and from emergent economies. CDM projects in LDC belong to what might be called ‘the high-end CDM market’ while CDM projects in emergent economies concern the overall goal of decarbonisation. Differentiation among the developing countries (especially for LDCs and SIDS) could be increased in various ways, for example further adapting the levies; discounting credits from non-LDCs or even through the use of quota systems (e.g. as suggested by Bolivia). Increased differentiation will always be difficult to achieve politically, but the climate regime needs to reflect the different economic conditions in the world.

Sustainable Development: Second, to achieve sustainable development within the CDM framework an increased differentiation between project types and technologies might be a way forward. While a global standard for sustainability seems unfeasible (defining sustainability top-down has always met opposition from developing countries), there are suggestions for more nuanced ways of enhancing the contribution of the CDM to sustainable development. Differentiation is not as drastic as setting standards. Differentiation as an option means favouring projects with clear sustainable development co-benefits and discounting for projects with no or few sustainable development contributions. From a developing country perspective, CDMs contribution to sustainable development is, at least in principle, important. Suggestions to enhance the CDM’s contribution to this objective could be beneficial to developing countries, but differentiation might also conflict with the CDM’s other objectives (providing low-cost emissions reductions to Annex 1 countries). A more radical option is to separate the two objectives of the CDM, leaving the achievement of sustainable development in developing countries to other mechanisms.

This option would focus on the CDM as an instrument for cost-effective emission reductions and create a fund for sustainable development outside of the CDM. Such a fund could be specifically aimed at funding projects with high sustainable development benefits, but with high costs and questionable additionality, such as some renewable energy and energy efficiency projects.

Sectoral CDM. Third, sectoral approaches are seen as promising since they are assumed to contribute to the structural changes necessary to promote long-term mitigation of greenhouse gas emissions in developing countries. They also have the potential to make projects with larger sustainable

development benefits viable under the CDM. An evolving and up-scaled CDM, or a similar mechanism for climate collaboration between countries, will continue to generate concerns regarding additionality, emission reductions, sustainable development, and the transfer of financial and technological resources. Sectoral approaches are a popular notion but would require the development of quite different methodologies for additionality and baseline emissions compared to the current project-based CDM.

Finally, discussions related to sectoral approaches have mainly been carried out at a theoretical level. One option is to launch a pilot phase with discounted sectoral credits to further examine the potential for sectoral CDM in practice. We need more and better knowledge about how additionality and baselines can be measured under different sectoral approaches. Since sectoral approaches require estimations of sectoral baselines and monitoring and verification of emission reductions, a pilot phase would be easiest to launch in advanced developing countries. An additional benefit for the participating countries would be an increased capacity to carry out national emission inventories.

With regards to the question of bottom-up vs. top-down approaches to ETS we highlight the following key points:

First, combining elements of the different carbon market architectures (bottom-up and top-down) might be an option to address some of their anticipated shortcomings. For example, it is conceivable that the international community agrees on an approach where a group of countries willing to adopt binding economy-wide caps continues the intergovernmental cap-and-trade system implemented by the Kyoto protocol after 2012. Unlike the Kyoto scheme this architecture can be designed as an open system, enabling other countries to join at later dates with either their entire economy or some sectors only, for example by linking their domestic emissions trading systems. Such an approach could be environmentally and economically more effective than pure bottom-up approaches, while being less prone to political stalemate and high transaction costs than the top-down approach. Also, by continuing to use the existing or reformed Kyoto mechanisms it would facilitate implementation of a future environmentally ambitious global trading architecture that builds on these pre-existing institutions that would otherwise cease to exist.

Second, even though top-down architectures promise a superior environmental effectiveness, they could turn into a drastic set-back in as much as they represent 'all-or-nothing' options – without a general agreement on burden-sharing, a complete political standstill would be imminent. In this case, bottom-up architectures, though only imperfect substitutes of top-down architectures, could enable co-operating regions to jointly reduce emissions in a cost-effective manner even in the absence of a global accord. In particular, a transatlantic carbon market created by linking a future US ETS to the EU ETS could create strong political momentum for international climate policy. Linking the EU ETS to emerging trading systems in the Asia-Pacific region could integrate a third central pillar of the international carbon market. However, when linking trading systems, care needs to be taken to ensure the environmental and economic integrity of the joint trading system. Also, linkages need to be assessed with regard to their potential of contributing to the European Union's aim of achieving the 2°C target in a cost efficient manner.

Finally, the two approaches are complementary in the sense that bottom-up architectures may serve as building blocks for comprehensive top-down architectures. Therefore, the devolution of inter-governmental permit trading to the company level could increase the economic performance of the international carbon market.

6.3 Adaptation to climate change and world politics

The impacts and vulnerabilities towards climate change differ among world regions and are inherently uncertain. It is certain, however, that the impacts of climate change, even with a 2 to 3 degree range of warming, could have detrimental effects on where people can live as well as on their ability to produce and access food.

One potential means of adaptation to meet this challenge could be improved access of farmers in developing countries to state-of-the-art research on farming technologies. So far developing countries are at a competitive disadvantage as a result of funding for agricultural research in general, including the protection offered to more adaptive crop seeds due to international intellectual property rights. Developed countries as well as the private sector may thus have a special role in aiding the farming sector in developing countries to adapt.

This support could come in the form of an adaptation levy to fund agricultural research in the south as well as a renegotiation of international intellectual property rights in the domain of agriculture. This could happen under what we call an Adaptation Food Security Protocol within the UNFCCC – the only global institution at present capable of bringing together the many diverse actors and institutions needed to bring about this change.

Regarding the possible problem of millions of climate refugees in the decades to come, our research showed that the existing governance mechanisms are not sufficiently equipped to deal with this looming crisis. In our ADAM research, we have outlined a blueprint for a global governance architecture on the protection and resettlement of climate refugees. We argue against the extension of the definition of refugees under the 1951 Geneva Convention Relating to the Status of Refugees but rather for a new legal instrument specifically tailored for the needs of climate refugees – a Protocol on Recognition, Protection and

Resettlement of Climate Refugees to the United Nations Framework Convention on Climate Change – as well as a separate funding mechanism, the Climate Refugee Protection and Resettlement Fund.

We have framed our proposal deliberately not in terms of emergency response and disaster relief, but of planned and organised voluntary resettlement programmes. In particular when it comes to rises in sea level, there is no need to wait for extreme weather events to strike and islands and coastal regions to be flooded. All areas that cannot be protected through increased coastal defences for practical or economic reasons need to be included early in long-term resettlement and reintegration programmes that make the process acceptable and endurable for the affected people. This, however, calls for *early action* in terms of setting up effective and appropriate governance mechanisms. The planning for a climate refugee protocol and the related institutional settings cannot wait until 2050 when it might be too late for orderly and organised responses. It must begin now.

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