WBGU

German Advisory Council on Global Change

Policy Paper

Climate Policy Post-Copenhagen

A Three-Level Strategy for Success

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Summary

International climate policy post-Copenhagen is in crisis. There is currently no prospect of the comprehensive and binding UN climate treaty – the outcome hoped for at the 2009 UN Climate Change Conference – being achieved within the foreseeable future. However, in order to keep the global mean temperature rise below 2°C by the end of the century, a resolute course must be set in the international climate process within the next few years. The German Advisory Council on Global Change (WBGU) recommends that in order to revitalise the multilateral climate process, policy-makers and civil society in Europe take on a self-confident leading role in global alliances with selected 'climate pioneer' countries and that more intensive support be provided for civil society initiatives. The aim of establishing a binding international regime to limit CO_2 emissions – based, for example, on the WBGU's own budget approach (WBGU, 2009) and similar approaches now also being discussed in China and India – must remain in place. The following recommendations are directed primarily at the German Government in light of its role in the international arena, particularly within the European Union (EU), at intergovernmental level via its bilateral and multilateral cooperation, and in the United Nations context.

Revitalising multilateral climate policy

- The WBGU considers it necessary to replace the consensus principle – which impedes the decision-making process – with a majority-based system of decision-making in the context of the United Nations Framework Convention on Climate Change (UNFCCC).
- It is essential to safeguard the key successes achieved in the UNFCCC process. This applies, not least, to agreements on adaptation to the climate change already taking place in particularly at-risk developing countries. However, Germany's commitments largely consist of funds already earmarked for climate protection and development cooperation, which undermines the credibility of pledges of support and weakens the developing countries' trust in the climate process.
- The EU should offer to endorse a second Kyoto commitment period even though this strand of negotiations under the UNFCCC has not yet produced a legally binding treaty, and notwithstanding the possible departure from the Kyoto process of some countries which are currently bound by reduction commitments. It should propose to cut its own greenhouse gas (GHG) emissions by at least 30% by 2020 from the 1990 baseline.
- The WBGU proposes a worldwide debate at the highest political level and within European civil society on how ambitious actions on climate can be implemented with a view to achieving compliance with the 2°C guard rail affirmed in the Copenhagen Accord.

Strengthening Europe's credibility through good practice

- The EU should develop its 20-20-20 Agenda into a 30-20-20 Agenda by committing to reduce greenhouse gas emissions by 30% by 2020. The aim of 100% energy provision from renewable sources for Europe by the year 2050, combined with a pro-active energy efficiency strategy, could give international climate policy fresh momentum, and put Europe's competitiveness on a sustainable footing at the same time.

- To speed up strategic innovation processes and to cut the costs of Europe's energy system, the WBGU recommends a Europe-wide system of feed-in payments for renewable energies. This would target financial support on locations with the best availability of each renewable resource.

- To develop future energy supply structures, the WBGU proposes the launch of a European initiative that builds on the objectives of the Lisbon Strategy. The implementation of a high-tech strategy – specifically, a renewables-based energy supply system for Europe combined with a new 'SuperSmart' grid – could demonstrate that economic efficiency and climate protection are by no means mutually exclusive.

- Initiatives launched by cities and municipalities in climate alliances, along with engagement by the business community and civil society organisations involved in climate-friendly transformation, should receive more attention and support from policy-makers at national and supranational level, in the WBGU's view.

Sub-global alliances of climate pioneers

- At present, the US and China are blocking each other – and therefore the global climate policy process as well. Europe can help to break this deadlock by exploring the option of sub-global climate alliances without the 'G2'. To that end, a pilot coalition should be set up, involving an ambitious group of key countries such as India, Brazil, Egypt, Indonesia, South Korea, Japan and the Maldives, representing various thematic areas such as forest conservation, infrastructural development, expansion of EU emissions trading, expansion of renewables, improving energy efficiency, and adaptation. This alliance, in the WBGU's view, should form privileged partnerships and thus become a self-confident driver of a new type of climate multilateralism, in a role similar to that once played by the six core countries of the European Economic Community. The pilot coalition would also signal that it believes in and supports a rapid transition to a climate-friendly world economy, thereby encouraging competition in the field of 'green innovation'.

- At the same time, the EU should encourage joint action on the individual thematic areas via education, research and technological cooperation with selected countries. As examples, the WBGU proposes three specific thematic alliances: (1) an alliance with key forest countries, (2) an alliance in the field of climate-friendly infrastructure, and (3) an alliance focussing on the expansion of the EU emissions trading scheme into new geographical areas.

The world after Copenhagen

The present scenario

In the Copenhagen Accord adopted at the UN Climate Change Conference in December 2009, the overwhelming majority of countries reaffirmed that climate change is one of the greatest challenges of our time and that the increase in mean global temperature should be below 2 degrees Celsius (UNFCCC, 2010). However, the Conference failed to produce a binding global treaty or the mechanisms required to achieve this goal. More than 120 countries which produce more than four-fifths of global greenhouse gas emissions have opted to engage with the Copenhagen Accord, with the majority having submitted notification of their voluntary action plans for reducing greenhouse gas emissions via the 'Pledge-and-Review' process; this means that mitigation targets set at national level are subject to international scrutiny. What is lacking at present, however, is a binding timetable and a global coordination mechanism, as well as a viable monitoring system and scope to impose sanctions in order to enforce countries' compliance with their declarations of intent. Furthermore, even if honoured in full, the intended actions notified to date fall short of what is required to limit the increase of the global mean temperature to 2°C; rather, judging from the current pledges, a global mean temperature increase of 3°C or more by the end of the century can be expected (Rogelj et al., 2010). In the scientists' view, however, a temperature rise of more than 2°C would result in dangerous disruption to the climate system, posing numerous and significant risks to human society (WBGU, 2004, 2009).

Recent debates in the media about supposed 'alarmism' and the 'manipulation' of climate research do not alter the scientific facts about climate change or the justification for the 2°C guard rail. Although the IPCC's Fourth Assessment Report (2007) contains an incorrect statistic relating to the melting of the Himalayan glaciers in a chapter about the regional impacts of climate change, much of the widespread and uncritical reporting in some of the media about other errors lacks any objective basis. In key points, most of the conclusions drawn in the IPCC report are by no means exaggerated: on the contrary, in light of recent monitoring data and research findings, they are actually somewhat optimistic. For example, sea-level rise and Arctic sea-ice decline have already exceeded the IPCC's predictions (Copenhagen Diagnosis, 2009).

The shift in policy course now occasionally being advocated, away from the current dual 'mitigation and adaptation' strategy towards a straightforward policy of remediation, would be irresponsible. Dykes cannot simply be built higher at will, and other coastal protection measures – such as dewatering pumps, mangrove reforestation, restoration of flood zones, relocation of residential areas or the creation of floating settlements – can only be implemented to a very limited extent at global level. Irrigation measures, too, can only safeguard agricultural production if there is still enough water available in the affected region.

The climate policy agenda

So what are the key items on the post-Copenhagen global climate agenda? *Firstly*, a significant number of political decision-makers around the world have yet to be convinced that decarbonisation and climate-friendly development can be achieved without a substantial decline of prosperity (demonstration effect). *Secondly*, there is a lack of consensus on a global distribution mechanism for mitigation and adaptation measures, financing, and technology transfer (here, a practical formula for burden-sharing is needed). Humankind faces a fundamental issue of justice here, which it currently appears to find overwhelming (WBGU, 2010). *Thirdly*, the emerging multipolarity in world politics, not only in global climate policy, means that a number of key actors are able to block substantial progress in the international climate process. Without the United States and other key nations such as China, India, Brazil, Japan and

Russia, and also the EU, climate policy breakthroughs are almost impossible to achieve (blockade on international action). At the same time, *fourthly*, there is still no sign of a coalition to take the lead on climate policy, with sufficient political influence to establish a climate architecture which adequately addresses the problem and cannot be obstructed by the rest of the world (coalition of forces for climate-friendly development). And finally, *fifthly*, there is a lack of recognition of, and response to, civil society's tangible willingness to act as a resource for pro-active climate and energy policy engagement, even though a viable approach to climate protection which also offers the prospect of sustainable development is appealing and capable of securing majority support (opportunities afforded by climate protection).

In order to keep the global mean temperature rise below 2°C, a resolute course must be set in the international climate process within the next few years. The WBGU advocates, in particular, the launch of focussed initiatives in global, European and national diplomacy, with Germany participating as a key actor, so that the EU can credibly fulfil its claim to play a pioneering role and 'lead by example'. To that end, the EU should develop a well-structured multi-level policy which combines 'bottom-up' approaches from civil society with strategic climate alliances involving pioneer countries and UNFCCC activities, with a view to the next Conference of the Parties in Cancún.

1. Decentralised, municipal and local-level initiatives involving businesses, public authorities and civil society have accepted the responsibilities arising from the need for compliance with the 2°C guard rail and are translating them into action via numerous formal and informal initiatives. The resulting climate coalitions and functioning municipal, scientific, educational, technological and business partnerships must be supported, networked and expanded.
2. Furthermore, the EU and its member states must forge credible and effective climate alliances with strategic partner countries. These diplomatic sustainability initiatives must also be geared towards interministerial cooperation, both nationally and internationally, reflecting the fact that the climate crisis is an interdisciplinary challenge for society as a whole. In research (Ostrom, 2010; Keohane and Victor, 2010) and in policy advice (E3G, 2010), polycentric approaches to climate policy are increasingly being mooted at present, for both conceptual and pragmatic reasons. After the failure to achieve a binding international treaty (top-down approach), hopes are increasingly resting on a revitalisation of climate policy via bilateral and regional cooperation.
3. While transnational alliances are becoming more important, climate policy should not rely on these alone. The EU should therefore continue to press for a comprehensive, legally binding climate treaty within the UNFCCC framework. The progress made to date in both strands of the UN negotiations should be established on a secure footing and expanded with a view to building on them at the Conference of the Parties in Cancún. It is essential to prevent the negotiations from stalling and ensure that UN climate policy does not suffer the same fate as the WTO Doha Round.

Following the disappointing outcome of the Copenhagen conference, it has become apparent that climate policy efforts must take place within a broader, interministerial context. Climate policy is not just about mitigation and reduction of greenhouse gas emissions, nor is it simply about expanding and promoting the use of renewable energies, energy efficiency and energy saving. Climate policy must also involve a broad industrial and social policy initiative which makes Europe, as a location for business and industry, more resilient to crises and offers the people of Europe an identifiable goal which also helps to forge a common identity. A new climate strategy should demonstrate convincingly to the people on our continent that it is not about renouncing prosperity and comfort, but about positively transforming our accustomed lifestyles into a sustainable society, in which our quality of life and opportunities for participation will increase. This type of climate policy strategy directly combines the quest for innovative technologies and new markets with the ethical obligation that arises, above all, from the existential threat to the world's island and coastal states particularly affected by dangerous climate change.

Strengthening Europe's credibility through good practice

In the negotiations on a follow-up treaty to the Kyoto Protocol, the EU was the most fervent champion of the 2°C guard rail, which was acknowledged by more than 100 states. The Alliance of Small Island States (AOSIS) is calling for the even more stringent limit of 1.5°C. However, neither the EU, nor individual member states, can claim the role of a pioneer or model pupil – its actual commitments are too tentative and the overall picture of European climate protection is too inconsistent. Only when the EU countries comply with more ambitious commitments will they be able to take the lead role in international climate policy advocated by the European Commission in March 2010 (European Commission, 2010a): *'We are now ready to transform Europe into the most climate friendly region of the world moving towards a low carbon, resource efficient and climate resilient economy.'*

The EU is likely to fulfil its Kyoto commitments, thereby boosting the credibility of its stated desire to protect the climate while at the same time demonstrating at international level – more than any other actor – the feasibility of achieving ambitious climate protection goals. All the more reason, then, for the EU to demand an ambitious climate treaty. The EU is the world's largest domestic market and has major technological skills and capacities in the field of climate and environmental protection. It has realised cost reductions in the green technologies sector, which in turn has enabled them to be deployed on a wide scale, also in developing countries. And the EU is also the largest donor in the fields of both technical and financial cooperation in developing countries, a role which should also be utilised to set a course towards a climate-friendly economy in the poorer partner countries.

For these reasons, the EU should drive forward the process of protecting the climate and fulfilling the 20-20-20 Agenda with real determination. This agenda aims to cut greenhouse gas emissions by 20%, increase the total renewables share to 20%, and achieve 20% more energy efficiency, all by 2020. The EU should develop this 20-20-20 Agenda into a 30-20-20 Agenda, i.e. it should aim to cut greenhouse gas emissions by 30% by 2020. Starting from the current emissions level, this figure can be translated into a phased target for linear reductions, such as a 1.5% annual reduction compared with the 1990 baseline, with a view to reducing emissions by 80% by 2050 compared with 1990. A reduction of just 20%, on the other hand, would diverge substantially from the pathway towards an 80% reduction and would require far more radical cuts in emissions post-2020.

The aim of 100% energy provision from renewable sources for Europe by the year 2050, combined with a pro-active energy efficiency strategy, can generate new momentum in the international climate process. Various studies conclude that renewables shares of 85–100% in the electricity sector (Krewitt et al., 2008; PriceWaterHouseCoopers, 2010) and 60% of primary energy (Krewitt et al., 2008) by 2050 are feasible. The 20% target for renewables should be developed further with a view to achieving 100% provision by mid-century. To that end, clear long-term signals and the stability that companies and the research sector require for their planning processes are essential. The EU provides an environment of unparalleled legal stability in this respect. The announcement of a 100% renewables target for Europe could inject fresh dynamism into the international climate policy process.

As part of a high-tech strategy to develop future energy supply structures, the WBGU proposes the launch of an European initiative that builds on the objectives of the Lisbon Strategy and combines them with the new concept of 100% energy provision from renewable sources for Europe. This will generate new and sustainable economic momentum and establish a credible basis for cooperation with developing countries and emerging economies. The involvement of the newly established *European Institute of Innovation and Technology* (EIT) in shaping this process can create the knowledge and education infrastructure required in this context.

A supply infrastructure based on renewables will not only boost security of supply; it also offers the prospect of new jobs for skilled workers and compliance with the 2 °C guard rail. It also has the potential to become more cost-effective than conventional energy systems. A key element of WBGU's proposal is therefore to dramatically increase efficiency measures, e.g. by means of electricity generation from wind, solar and hydropower with no waste heat losses, a massive expansion of combined heat and power generation (CHP) combined with sustainable use of bioenergy (WBGU, 2010), and, not least, the systematic introduction of electromobility.

A strategy which, with the aid of appropriate information and communication technologies, facilitates the integration of a substantial renewables share and its broad-scale transmission via a trans-European Super-Smart Grid, firmly establishes electromobility in the transport sector and links these with highly efficient end-use technologies can point the way for Europe to enter a new energy supply era. In this way, Europe can also demonstrate to the international community that economic efficiency and climate protection are compatible with each other. In the EU, many of the elements necessary for such a move towards climate-friendly development are already in place. They simply need to be 'joined up' and firm timetables established. Furthermore, the various climate-damaging incentive systems and subsidies must be abolished as a matter of urgency, and support must be provided for decentralised energy production at the local and regional level. In Europe, there are outstanding examples of climate-friendly cities involving committed local businesses which are keen to safeguard and expand their competitiveness through climate-friendly investment. Examples include cities such as Malmö and Freiburg i.Br. The 'InnovationCity Ruhr', the brainchild of the *Initiativkreis Ruhr*, consisting of representatives of the Rhine and Ruhr Region's leading concerns in trade and industry and public institutions, is a metropolitan region which also deserves to be mentioned. These can be connected within a European network of cities, providing scope for further linkages at international level.

Reflecting its own multidimensionality, the climate issue touches a very wide range of responsibilities and agendas. For that reason, strategic cooperation among government departments at national and EU level is needed now more than ever before. Key ministerial portfolios of relevance in this context include foreign affairs and development cooperation, but also aspects of land use, consumer protection, economic and fiscal policy, housing and construction, regional planning, health, transport policy and, not least, research and education. In short, climate and sustainability issues must break free of their niche existence.

Sub-global alliances of climate pioneers

At present, the US and China are blocking each other – and therefore the global climate policy process as well. Europe can help to break this deadlock by exploring the option of sub-global climate alliances beyond the 'G2'. As the starting point for a network of 'climate pioneers', a core alliance consisting of an ambitious group of key countries such as India, Brazil, Egypt, Indonesia, South Korea, Japan and the Maldives should be set up, representing various thematic areas such as forest conservation, infrastructural development, expansion of EU emissions trading, expansion of renewables, improving energy efficiency, and adaptation. This alliance, in the WBGU's view, should form privileged partnerships and thus become a self-confident driver of a new type of climate policy multilateralism and a broad network of countries committed to climate protection, in a role similar to that once played by the six core countries of the European Economic Community. The core coalition would also signal that it believes in and supports a rapid transition to a climate-friendly world economy, thereby encouraging competition in the field of 'green' innovation.

Despite their very different interests, the US and China, the main producers of greenhouse gas emissions, both contributed to the disappointing outcome of the climate negotiations in Copenhagen. An ambitious global climate policy must include both these actors. In a setting characterised by the multipolarity outlined above, the EU must develop a new geopolitical climate strategy and needs to determine the key actors with which it seeks to forge alliances of climate pioneers.

China, at present, does not appear to be amenable to participation in binding international agreements, but has done much to protect the climate at national level. What's more, by demonstrating 'green development leadership', it is seeking to exercise 'soft power' in a bid to show the Chinese regime in a better light, given its patchy record on democracy and human rights. For example, China already has the world's largest manufacturing capacity for solar collectors and solar cells and will presumably soon achieve the same status for wind turbines. Ambitious expansion goals are driving the rapid growth of the renewables share in China. In the United States, ambitious climate protection programmes in a number of US states and many cities offer interesting opportunities for joint initiatives. Gas exporter Russia, too, could be a highly attractive partner in view of its substantial accumulated need for building modernisation and upgrading of its transport infrastructure. Within the EU, this also applies to various East Central European countries, two of which (Hungary and Poland) will hold the Council Presidency in 2011. Major emerging economies, particularly Brazil and India, could also be secured as partners for joint energy supply strategies. Alongside its specific locational advantages, Brazil has already built up considerable technical experience in the field of bioenergy use, which is becoming increasingly relevant to both the energy and the transport sector.

The world cannot wait until the US and China – jointly or individually – are ready to take on more ambitious climate commitments. Europe can help to break this stalemate by seeking to forge sub-global climate alliances with selected partners pursuing ambitious climate goals, not least with a view to facilitating a legally binding treaty within the UNFCCC framework. To that end, Europe should move beyond verbal commitments and fragmented models of climate and energy policy cooperation and seek to generate real and effective force. It should become an attractive focal point for highly ambitious climate alliances, with incentive schemes to build an international network of climate pioneers.

There is already scope to set up international climate alliances and expand existing forms of cooperation for the period following the expiry of the Kyoto Protocol first commitment period in 2012. There is scope, too, for clever linkage between climate protection and other areas of international cooperation, thus leveraging greater commitment from the international community to climate action. Joint initiatives in the field of education, research and technology are just some of

the potential starting points here. Countries that wish to develop ambitious climate protection strategies can benefit from cooperation with European research institutes or technology partnerships.

In development cooperation, too, there is scope for ambitious programmes focussing on climate-friendly development. The EU should offer opportunities for the development of decarbonisation partnerships extending far beyond the EU's current climate cooperation initiatives. These forms of cooperation are important in view of the current deadlocks in the international climate policy process, as they could help to achieve real progress with the decarbonisation of the world economy and demonstrate that competitiveness and social development can be successfully combined within the framework of climate policy strategies. Through their interaction, the alliances should help to expedite the turnaround that is needed in the world economy to become climate-friendly. Once a certain size, attractiveness, level of productivity and collective innovation force have been reached, this would ensure that societies that are still oriented towards 'high carbon' growth would come under increasing pressure to adapt.

Below, the WBGU outlines three practical examples of thematic alliances. The EU should give technical, financial and institutional input here, in order to make a verifiable contribution to joint climate goals. The three examples are: (1) cooperation with countries with a high level of greenhouse gas emissions from deforestation; (2) cooperation on the expansion and climate-friendly modernisation of infrastructure (particularly energy technology and transport systems), primarily with developing countries and emerging economies; (3) linkage between the European emissions trading system and the systems of other countries and regions.

Forest policy

Strategic cooperation with relevant countries with forest ecosystems is desirable, among other things, because a clear reduction in emissions from deforestation is a key prerequisite for compliance with the 2°C guard rail. At the Climate Change Conference in Copenhagen, substantial progress was achieved in the technical negotiations on the forest sector, for example on the scope of eligible mitigation measures and the avoidance of sustainability risks. It is important to build on this progress at the next Conference of the Parties in Cancún, with a view to achieving agreement on a global framework for reducing emissions from deforestation and forest degradation (REDD+), along with global targets and a timetable to stop deforestation. In Copenhagen, the developed countries pledged total funding of USD 30 billion for the period 2010-2012 (fast start financing). Germany and the EU should earmark an appropriate proportion of these additional funds for the forest sector. Starting with these already agreed outcomes, bilateral alliances can be driven forward with selected partner countries, such as Indonesia, Brazil, Papua New Guinea, and the Democratic Republic of the Congo, in the forest sector and regional exchange can also be encouraged. This type of cooperation offers scope to develop and trial the technical and administrative framework that is essential for swift and successful implementation of REDD projects. In this way, important experience can be gained and exchanged on ways of implementing the UNFCCC's very general provisions under widely varying national conditions. This applies to the development of monitoring and reporting systems to measure emissions in the forest sector as well as to the question how other key dimensions of sustainability and development can be taken into account, such as conservation of natural forests and biodiversity, and the participation and rights of local and indigenous communities. The knowledge thus gained can then feed back into the UNFCCC process and assist other countries with implementation. These alliances would allow the wealth of experience gained with individual projects to be integrated into a bilateral or multilateral strategy and driven forward on a larger scale.

Climate-friendly infrastructure

Strategic partnerships, especially with developing countries and emerging economies, are a useful vehicle for the expansion and modernisation of climate-friendly infrastructures, particularly in relation to resource-efficient technologies for energy and transport systems.

Countries in North Africa, such as Morocco, are obvious strategic partners for the establishment of a trans-Mediterranean supergrid to transmit solar- and wind-generated electricity. Substantial cost reductions can be achieved if regions with high levels of potential capacity are involved in efforts to establish an energy system based largely on renewable sources. Existing initiatives such as DESERTEC or the Mediterranean Solar Plan must, in any case, be flanked by grid connection schemes. The strategic linkage with the wind power/water storage potential of the North Sea states, for example, in a continental supergrid must be the aim. For the EU, the expansion and integration of solar energy from Europe's Mediterranean countries into this supergrid offer advantages, both in terms of increasing supply security and improving competitiveness compared with conventional alternatives. For the North African countries, too, this network can bring benefits, both

economically and in terms of their own electricity supply technology.

Gas grids, together with liquefied gas processing and transport systems, offer further opportunities for integration. In Central and Eastern Europe, there is also substantial potential for sustainable biomass production. By generating methane from biogas or from surplus electricity, even countries with no natural gas reserves of their own could in principle become net exporters of natural gas substitutes.

Both examples show that energy partnerships should be an important part of EU foreign policy. In general, accelerated expansion of renewable energies offers the EU interesting opportunities for cooperation. In order to create appropriate incentives, 40 countries worldwide (including 18 EU member states) have already established systems of feed-in payments in order to speed up the attainment of cost parity with electricity generated from conventional fuels. Whereas investment decisions in the European framework have so far been left largely to the free market, investments in the context of strategic partnerships could be backed by appropriate credit guarantees (e.g. from the *European Bank for Reconstruction and Development – EBRD*).

Furthermore, European development cooperation can also contribute to the development of climate-friendly infrastructures in the poor developing countries of sub-Saharan Africa and South Asia, as well as in medium-sized developing countries such as Vietnam and Peru. The EU and its members provide 60% of the world's investment in international development cooperation. This development policy lever is currently not being utilised systematically in order to make the new climate-friendly development paradigm internationally attractive. As well as focussing on fulfilling the Millennium Development Goals (MDGs), which are mainly geared towards poverty reduction, European development cooperation must pursue a systematic course towards climate-friendly growth. This reorientation would not only help to cut greenhouse gas emissions; above all, it would also demonstrate, with the help of practical examples, that poverty reduction can be coupled with economic growth and show how this can be achieved. This could refute the view – widespread in developing countries – that climate-friendly development is a luxury strategy that only the industrialised countries can afford. This systematic reorientation of development cooperation would also revitalise the relationship of trust between industrialised and developing countries which is urgently needed in the ongoing climate process.

Emissions trading

Alliances can also be forged in the context of emissions trading. A key building block of European climate policy is the EU's Emissions Trading System (EU ETS). Despite some initial difficulties, primarily due to the lack of scarcity of allowances and high price volatility, which current and future reforms are expected to resolve, the system can serve as a model for others. The WBGU recommends that it be taken as a starting point for inter-country cooperation. Negotiations could take place with individual countries or regions which have already introduced or plan to introduce emissions trading schemes about the possibility of linkage with the ETS. Examples of potential partners include Japan, Canada (Western Climate Initiative), Australia (NSW Greenhouse Gas Abatement Scheme), New Zealand and the United States (Regional Greenhouse Gas Initiative).

This would increase market liquidity for all participating companies and open up new potential for mitigation. Countries which have not yet adopted national emissions ceilings could be integrated into the system on a sectoral or progressive basis. One option, for example, would be for a country to introduce an absolute or relative emissions ceiling for just one narrowly defined sector at first and to link this to the ETS. For developing countries and emerging economies in particular, this could create an incentive if a relatively generous emissions ceiling were selected. However, this would need to be balanced out by the ambitious ceilings set by the EU. It is therefore important for all the participating countries to establish an effective control and monitoring system in order to avoid any watering down of the ETS. The harmonisation of accounting standards and detailed provisions on issues such as the eligibility of 'offsets' (e.g. CDM or land-use emissions) should also be established, both between countries and within the framework of the UNFCCC rules.

It is important to bear in mind that this type of cooperation will further increase the complexity of the existing emissions trading system. The volume of emissions additionally covered by the scheme and the reductions actually achieved must therefore justify this effort. For the future, these measures should help to progressively create a global carbon market whose features must now be discussed. One question which arises, for example, is whether, in the medium term, it would be sensible to record emissions at the first stage of trading in order to reduce bureaucracy and increase the efficiency of the system.

Flanking technological cooperation initiatives could further increase the willingness to participate in these linked emissions trading schemes. Imposing explicit trade sanctions on non-participating countries would

not be beneficial in terms of achieving the desired outcomes, in the WBGU's view. To reduce competitive disadvantages, however, moderate border tax adjustments for the sectors concerned could be considered.

Conclusion

With the international alliances outlined here, Europe can create the political capital and scope for action that it needs to take on a leading role in global climate policy. The alliances outlined above are inclusive and are designed to encourage positive and participatory competition. The aim of the new European climate diplomacy would be to generate a critical mass of climate-oriented partners so that a course can be set towards a climate-friendly world economy. The partnerships presented here as examples could, in the WBGU's view, also help to bridge the gap between the basic normative consensus on the need for compliance with the 2°C guard rail and the inadequacy of those structures and procedures in international cooperation that should be playing a key role in achieving such compliance.

Revitalising multilateral climate policy

As the Climate Change Conference in Copenhagen showed, the international climate negotiations are progressing at snail's pace at best. However, an effective strategy to limit anthropogenic climate change – especially under substantial time pressure – has no real prospect of success without an internationally binding climate treaty as the starting point. Despite all the frustrations surrounding the derailed UN climate process, an approach based solely on intergovernmental initiatives would be beset by at least two fundamental risks. Firstly, it is completely uncertain whether the process agreed in the Copenhagen Accord can come close to achieving the emissions reductions necessary for compliance with the 2 °C guard rail. And secondly, a system which lacks overarching coordination and sanction mechanisms cannot overcome the problem of carbon leakage, i.e. the transfer of emissions to non-cooperating countries, or the collective problem of free-riding (WBGU, 2004, 2009).

Examples of past successes in global environmental policy, such as the international agreements on the protection of the ozone layer, are mainly based on treaties adopted with binding force under international law. Key factors determining the success of the *Vienna* Convention for the *Protection* of the *Ozone Layer* and the associated Montreal Protocol, for example, include:

- the innovative features of the treaty in terms of international law: the treaty is based on a framework fleshed out by protocols with specific reduction commitments for the production and use of substances that deplete the ozone layer;
- the dynamic character of the decision-making process established for the revision of the Montreal Protocol, which can be amended with a two-thirds majority, rather than on the basis of the consensus principle which otherwise applies in international treaty law;
- the establishment of an innovative long-term financing mechanism which covers the additional costs accruing to the developing countries as a result of their fulfilment of their reduction commitments.

In order to make further adequate progress with the international climate regime, it is essential to ensure that there is scope to respond swiftly and flexibly to new scientific findings and technological developments by means of protocol amendments approved by a majority decision under international treaty law. It is equally important to secure, at this stage, the financing for mitigation and adaptation measures in accordance with the principle of responsibility, taking particular account of developing countries' needs.

A consistent climate protection policy regime backed by an international treaty would greatly increase the prospects of avoiding dangerous climate change. There are four main arguments in favour of an international climate treaty which imposes binding obligations on the parties and introduces effective enforcement and dispute settlement mechanisms:

1. it would create clear and irreversible incentives for the reduction of emissions;
2. it would limit carbon leakage and free-riding, and curb the risk of 'climate protectionism';
3. it would create predictability for transnational companies based on a long-term and stable global framework, which also helps to defuse potential tensions between economic and climate policy;
4. joint rule-setting and reciprocal monitoring would help to build trust between the main climate actors (China, USA, EU, G77).

If this type of regime, based on international law, is not achieved within the existing UNFCCC process and this process is simply pursued through normal diplomatic channels, the outlook looks very bleak. So it is essential to salvage what can be salvaged for a future regime and

pursue agendas which can be expedited or separated out most easily.

Key successes achieved in the UNFCCC process which must certainly be safeguarded include a shared understanding of, and joint standard-setting in relation to, the recording, allocation and counting of greenhouse gas emissions. In part, this is already regulated under the Kyoto Protocol (e.g. eligibility rules for national emissions inventories, land use, land-use change and forestry (LULUCF), Clean Development Mechanism), and other aspects are currently the subject of the second strand of negotiations (e.g. REDD+; Measurement, Reporting and Verification). While the WBGU considers that there is scope to improve many of these rules, it takes the view that these transparent and internationally agreed arrangements must form the basis for a trust-based system of international climate cooperation.

This applies especially to adaptation to climate change in developing countries. The need for comprehensive support to be provided by the industrialised countries to the least developed countries is enshrined as a principle in the UNFCCC. This was specified in more detail with the agreement to establish an Adaptation Fund and the adoption of the Nairobi Work Programme (UNFCCC, 2007) and reaffirmed in line with the principle of common but differentiated responsibilities at international level. Many developing countries regard it as imperative that the further development and implementation of relevant policies should continue to be pursued within the UNFCCC framework.

The division of the parties to the UNFCCC into two groups – Annex I and non-Annex I countries – is no longer appropriate, given the complexity of international climate policy. Even though many developing countries and emerging economies insist that this dichotomy must be maintained, some differentiation within the group of non-Annex I countries is needed in order to speed up the international climate process. In Copenhagen, developing countries and emerging economies were invited to specify quantitative climate targets at the international level for the first time, in the Appendix to the Copenhagen Accord, a request which they generally complied with. In particular, implementation of the verification mechanisms agreed in the Copenhagen Accord could provide a precedent for overcoming this now outdated dichotomy.

As the above-mentioned example of the Montreal Protocol shows, more effective decision-making procedures could also help to break the deadlocks in the negotiations that result from the consensus principle and speed up the negotiating process. To that end, the EU should support the application of the majority principle provided for in Article 7 (3) of the UNFCCC.

In the Copenhagen Accord, the developed countries pledged to provide additional resources totalling USD 30 billion for mitigation and adaptation, technology transfer and capacity-building in the developing countries for the period 2010–2012, with the goal of mobilising USD 100 billion dollars a year by 2020. According to the Copenhagen Accord, a significant portion of such funding should flow through the Green Climate Fund. However, in many cases, the additionality of these funds is not guaranteed. For example, the € 420 million pledged by Germany mainly consists of funds already earmarked for climate protection and development cooperation (WRI, 2010), with only € 70 million in new funding allocated in the 2010 federal budget to fulfil the pledges made in Copenhagen (BMF, 2010). This type of approach undermines the credibility of financial pledges made at the international level and damages the developing countries' trust in the climate process, and is therefore counterproductive in the long term.

Unified and transparent structures must be developed for the administration and disbursement of the pledged funds. Here, it is important to ensure that all the pledged funds fulfil the criterion of additionality. Furthermore, in the WBGU's view, disbursement should be performance-based. The EU should work to ensure that the Green Climate Fund is established within the UNFCCC framework. Some differentiation between the mitigation and adaptation sectors seems sensible. For mitigation, a new concept must be developed that is viable in the long term, whereas in the adaptation sector, experience gained with the newly established Kyoto Adaptation Fund can be drawn on in order to devise a concept for its longer-term institutional development. To help build trust between countries, the WBGU recommends that the industrialised countries submit specific strategies immediately, showing how they intend to mobilise resources for the fund(s) on a reliable basis over the long term. In the WBGU's view, a substantial share of the funding must also come from public budgets.

Finally, the EU should offer to endorse a second Kyoto commitment period even though this strand of negotiations under the UNFCCC has not yet produced a legally binding treaty, and notwithstanding the possible departure from the Kyoto process of some countries which are currently bound by reduction commitments. The only condition should be that the main points agreed in the Copenhagen Accord must be integrated and operationalised in the further negotiation process. The 'Pledge-and-Review' process in particular should be governed by transparent rules and become binding under international law. This desirable solution would be a pragmatic 'success' of the Conference of the Parties in Cancún. The EU would signal that it continues to support an internationally binding climate regime and does

not wish to jeopardise the progress already achieved in the negotiations. This would ensure that after the end of the first Kyoto commitment period in 2012, the world would not face the complete absence of an effective international climate regime.

Conclusions

In this Policy Paper, the WBGU proposes a swift and resolute turnaround in global climate policy. The climate negotiations to achieve a binding international treaty to limit greenhouse gas emissions must be revitalised and supplemented with a package of new initiatives. The Policy Paper has outlined the structure of a multi-level system which – following the inadequate outcome of the Copenhagen climate summit – takes up its positive aspects but also takes account of the tensions arising in a polycentric world order and, proceeding more strongly from a societal and economic basis, moves towards global governance in the climate and energy sectors. This encompasses a wide variety of approaches which must be distinguished in analytical and practical terms:

- sub-national climate initiatives and alliances of cities, supplementing centralised and supranational endeavours to steer the climate process;
- corporate activities, creating a market for climate-friendly products and services;
- voluntary and individual reduction commitments by civil society which anticipate or exceed legal and administrative rules;
- a climate policy modelled on the Montreal Protocol and building on a variety of mechanisms and regimes;
- a climate policy which reflects the multipolarity of world politics and creates space for spontaneous or coordinated government initiatives (such as the programme to protect the Amazon in Brazil, which is supported by Germany and Norway, or the UK's low-carbon partnership with China) and para-state approaches (such as the Soros Climate Policy Initiative or the initiative, launched by the Munich Re Foundation, to extend insurance protection to small farmers in developing countries at risk from climate change).

This multi-level approach, which continues to have an internationally binding climate treaty as ultimate goal, should be supplemented with a worldwide debate, underpinned by strategy papers, on the implementation of the Copenhagen Accord. This should focus in particular on ways of closing the wide gap between the commitments proposed and those required to achieve compliance with the 2°C guard rail, and on ensuring that the climate issue is given due relevance in the formulation of global policy objectives.

Possible forums that can be considered for this strategic debate ('Solutions Dialogue') include parliamentary and quasi-parliamentary bodies (from the European Parliament to the UN General Assembly), thematic and moderated Internet forums (modelled on the debate about the European constitution and the discussion forum on the Future of Europe) (see, for example, European Parliament, 2010; European Commission, 2010b). Furthermore, the WBGU proposes a worldwide competition of ideas on the best solutions to, and best practice in, climate protection. These forms of participation will also enable the input of European civil society to be taken seriously. Civil society, however, will only contribute to the debate if it sees that its participation is relevant to the decision-making process within the EU, its member states and the United Nations and recognises that this is a historic project with a wider scope than simply the technical and economic details of climate diplomacy. Political cooperation – as the example of the EU shows – can evolve from sectorally and regionally limited but nonetheless important agendas and create a political identity. Europe must replicate this success today, albeit in a global framework.

The multi-level policy sketched out by the WBGU should not at any point distract attention from the fact that a sustainable strategy to deal with climate change must address the basic issue of fair international burden-sharing. As described in the WBGU's own Special Report, entitled 'Solving the Climate Dilemma' (WBGU, 2009), humankind only has a limited emissions budget at its disposal if the risk of uncontrollable environment change is to be contained. The numerous initiatives and innovations proposed here could help to make wiser use of this budget and mitigate the burden to be shared. Nonetheless, a substantial burden will remain – and must be borne by the international community in a fair and responsible manner. The physics underlying the climate change process remains unchanged, whether viewed from the top down or from the bottom up.

References

Allison, I., Bindoff, N. L., Bindschadler, R. A., Cox, P. M., de Noblet, N., England, M., Francis, J., Gruber, N., Haywood, A., Karoly, D., Kaser, G., Le Quéré, C., Lenton, T., Mann, M., McNeill, B., Pitman, A., Rahmstorf, S., Rignot, E., Schellnuber, H. J., Schneider, S., Sherwood, S., Somerville, R., Steffen, K., Steig, E., Visbeck, M. and Weaver, A. (2009): The Copenhagen Diagnosis: Updating the World on the Latest Climate Science. Sidney: University of New South Wales.

BMF – Bundesministerium für Finanzen (2010): Haushalt 2010: Nettokreditaufnahme geringer als erwartet. Internet: http://www.bundesfinanzministerium.de/nn_54/DE/Wirtschaft__und__Verwaltung/Finanz__und__Wirtschaftspolitik/Bundeshaushalt/20100308-Haushaltsausschuss.html?__nnn=true). Berlin: BMF.

E3G – Change Agents for Sustainable Development (2010): Building the 2 °C Coalition: European Climate Diplomacy after Copenhagen. E3G Discussion Paper 1. London, Berlin, Brussels: E3G.

European Commission (2010a): International Climate Policy Post-Copenhagen: Acting now to Reinvigorate Global Action on Climate Change (COM(2010) 86 final). Brussels: European Commission.

European Commission (2010b): Democracy – Dialogue – Debate: Climate Change and Energy. Website: http://ec.europa.eu/archives/debateeurope/climate-change/index_en.htm. Brussels: European Commission.

European Parliament (2010): The Lisbon Treaty. Website: http://www.europarl.europa.eu/parliament/public/staticDisplay.do;jsessionid=73251029FF360EEC144C06EEBAAF2834.node1?language=EN&id=66. Brussels: European Parliament.

IPCC – Intergovernmental Panel on Climate Change (2007): Climate Change 2007. The Fourth Assessment Report of the IPCC. Cambridge, New York: Cambridge University Press.

Keohane, R. O. and Victor, D. G. (2010): The Regime Complex for Climate Change. The Harvard Project on International Climate Agreements. Discussion Paper 10-33. Cambridge, MA: Harvard Kennedy School.

Krewitt, W., Teske, S., Simon, S., Pregger, T., Graus, W., Blomen, E., Schmid, S. and Schäfer, O. (2009): Energy [R]evolution 2008 – a sustainable world energy perspective. Energy Policy 37, 5764–5775.

Ostrom, E. (2010): A Polycentric Approach for Coping with Climate Change. Background Paper to the 2010 World Development Report. Policy Research Working Paper 5095. Washington, DC: World Bank.

PWC – PricewaterhouseCoopers (2010): 100 % Renewable Electricity. A Roadmap to 2050 for Europe and North Africa. London: PWC.

Rogelj, J., Nabel, J., Chen, C., Hare, W., Markmann, K., Meinshausen, M., Schaeffer, M., Macey, K. and Höhne, N. (2010): Copenhagen Accord pledges are paltry. Nature 464, 1126–1128.

UNFCCC – United Nations Framework Convention on Climate Change (2007): Report of the Conference of the Parties on its Twelfth Session, held at Nairobi from 6 to 17 November 2006: Part Two: Action Taken by the Conference of the Parties at its Twelfth Session (FCCC/CP/2006/5/Add.1). New York: United Nations (UN).

UNFCCC – United Nations Framework Convention on Climate Change (2010): Report of the Conference of the Parties on its Fifteenth Session, held in Copenhagen from 7 to 19 December 2009, Addendum. Part Two: Action Taken by the Conference of the Parties at its Fifteenth Session, FCCC/CP/2009/11/Add.1, 30 March 2010, 2/CP.15 Copenhagen Accord. New York: United Nations (UN).

WBGU – German Advisory Council on Global Change (2004): World in Transition: Towards Sustainable Energy Systems. London: Earthscan.

WBGU – German Advisory Council on Global Change (2009): Solving the climate dilemma: The budget approach. Special Report. Berlin: WBGU.

WBGU – German Advisory Council on Global Change (2010): Future Bioenergy and Sustainable Land Use. London: Earthscan.

WRI – World Resources Institute (2010): Summary of Climate Finance Pledges Put Forward by Developed Countries. February 18, 2010, updated March 4 2010. Internet: http://pdf.wri.org/climate_finance_pledges_2010-03-04.pdf). Washington, DC: WRI.

Current Reports of the WBGU

Solving the climate dilemma: The budget approach. Special Report.
Berlin: WBGU © 2009, 58 pages, ISBN 978-3-936191-27-1.

Future Bioenergy and Sustainable Land Use. Flagship Report.
London: Earthscan © 2010, 365 pages, ISBN 978-1-84407-841-7.

Climate Change as a Security Risk. Flagship Report.
London: Earthscan © 2008, 248 pages, ISBN 978-1-84407-536-2.

The Future Oceans – Warming Up, Rising High, Turning Sour. Special Report.
Berlin: WBGU © 2006, 110 pages, ISBN 3-936191-14-X.

World in Transition: Fighting Poverty through Environmental Policy. Flagship Report.
London: Earthscan © 2005, 289 pages, ISBN 1-85383-883-7.

Climate Protection Strategies for the 21st Century: Kyoto and beyond. Special Report.
Berlin: WBGU © 2003, 77 pages, ISBN 3-936191-04-2.

World in Transition: Towards Sustainable Energy Systems. Flagship Report.
London: Earthscan © 2004, 242 pages, ISBN 1-85383-882-9.

Charging the Use of Global Commons. Special Report.
Berlin: WBGU © 2002, 48 pages, ISBN 3-9807589-8-2.

World in Transition: New Structures for Global Environmental Policy. Flagship Report.
London: Earthscan © 2001, 231 pages, ISBN 1-85383-852-7.

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