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No Money Left for Climate Protection? Climate Policy after the Crisis

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1. Introduction

While possibilities to overcome the global financial and economic crisis and to mitigate its negative impacts are dominating the political and scientific agendas, there are also voices that stress that we are actually facing a "double crisis" and that "dangerous climate change poses a permanent and far more serious threat to human development and prosperity" (Edenhofer & Stern 2009). Heat weaves like those in Europe in 2003 and hurricanes like hurricane Katrina that destroyed New Orleans in 2007 give us first impressions of what the effects of rising global temperatures could result in. The IPCC report from 2007 has stressed again the necessity for global emissions to peak within the next few years and for emission reductions of 50 per cent relative to today by mid-century in order to stay within manageable temperature increases. As a result of the economic crisis and decreasing industrial production global greenhouse gas (GHG) emissions are projected to decline by 2 to 5 per cent. Yet, to reach the 50-per-cent-target that has also been acknowledged by the G8-Summit in Heiligendamm in 2007 and was on the table at the recent G20 summit in London in April 2009, global emissions need to decrease by around 1.5 per cent annually for the next 40 years. A few years of reduced emission growth will thus only contribute little to solving the global climate problem if we return to business as usual after the crisis. Whether or not the impacts of climate change soon supersede the financial crisis with respect to its economic and social dimension will depend crucially on whether the 50 per cent reduction of global GHG emissions until 2050 will be successful. This implies that the current emission reductions caused by the economic recession need to be put on a permanent basis – however, without the huge macro-economic costs of the economic crisis.

There is some hope that the current crisis gives us the possibility to rethink our current economic system, the global imbalances and, not less relevant, its dependency on fossil fuels. The eventual challenge is the necessary initiation of structural changes to reach an economic and environmental sustainable growth path after the crisis. Inspired by the "New Deal" of US President Franklin D. Roosevelt that was an answer to the great depression of the 1930s the UN envisages the economy to react to the current global crisis with a "Global Green New Deal" (cf. UNEP 2009). One chance for a "green global recovery" (Edenhofer & Stern 2009) lies in the large economic stimulus packages that have been passed in the major economies.

Worldwide, approximately $ 2.7 trillion have been earmarked by governments for these packages aimed at remedying the global economic downturn. This sum, which amounts to 4.7 per cent of world income, is intended primarily to stop the downward spiral of cancelled investment plans and cuts in production and employment, as well the shrinking income and demand caused by such cancellations and cuts. In addition, it is also explicitly intended to put the world economy on a new and sustainable growth path. The sizes and the nature of the stimulus packages vary considerably from country to country. Figure 1 shows that in absolute monetary terms, China and the United States have the largest stimulus packages.

Stimulus packages in the EU member states amount to only 15 per cent of the packages worldwide. In relative economic terms also, the EU member states spend only 1.6 per cent of EU GDP on stimulus packages, whereas the United States are spending approximately 7 per cent and China is spending approximately 14 per cent. The United States and China are, however, also the largest emitters of CO_2. Consequently, especially the "green" focus of their stimulus packages is very important for the sustainability of the new growth path.

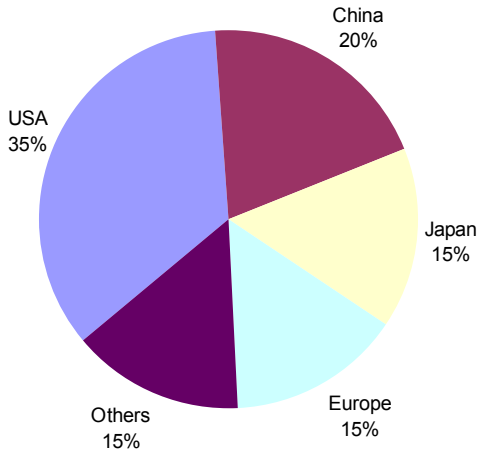

Figure 1: World Wide Stimulus Packages

Altogether, the stimulus packages provide opportunities to invest heavily in emission-saving measures and structural adjustments, and to initiate climate friendly growth. The question is whether these opportunities are actually taken advantage of, to what extent the funds are likely to be used for green measures and how many GHG savings these imply. In their "Green New Deal Proposal" the United Nations Environment Programme (UNEP) estimated that $ 750 billion or roughly a quarter of the worldwide stimulus packages are necessary to reach a "green" growth path (UNEP 2009). In Section 2 we will assess whether the major stimulus packages can reach this tentative target, give an overview about the planned green measures and evaluate their contribution to economic and ecological sustainable growth.

Beside this positive impact of the economic crisis on climate change mitigation there is also the danger that lobbying against climate policies especially from energy producers as well as energy-intensive industries has higher chances of being successful in times of recession. Assumably, the economic crisis will be used as an excuse to postpone stringent climate policy measures which are costly in the short term. Australia, for example has already announced that it will delay its anticipated Carbon Pollution Reduction Scheme (CPRS) by one year explicitly mentioning the global economic crisis as the reason. Section 3 addresses the question whether there is major evidence that the global financial and economic crisis effects national climate protection legislation.

In the worst case the attitude that there are currently other priorities and neither scope nor funds for climate protection will also negatively influence the ongoing negotiations of a follow-up treaty of the Kyoto Protocol that expires in 2012. The main issue in this context is the inclusion of major developing and emerging countries, which are estimated to contribute more than 50 per cent to overall annual global GHG emissions by 2030, into a Post-Kyoto treaty. These countries argue with some justification that the developed countries are responsible for almost 80 per cent of anthropogenic GHG emissions since the industrial revolution and have much higher per capita emissions than the developing countries. Hence, they argue that the developed countries should carry most of the reduction costs. There are different possibilities for burden sharing including the allocation of emission rights in an international emission trading system or direct transfers. One option that is currently discussed is an adaptation fund to which mainly developed countries could contribute. This fund could be used to alleviate the adverse effects of global warming which will mostly occur in developing countries. Finding an agreement on a global level at the United Nations Climate Change Conference in December in Copenhagen, Denmark has thus become more difficult. The prospects for the Post-Kyoto negotiations in the light of the current global financial and economic crisis are addressed in more detail in Section 4.

Altogether, the aim of this paper is to summarize the main positive and negative effects of the global crisis for reaching global emission reductions. Will the world use the opportunity to initiate necessary structural adjustment in the current way of producing and consuming energy, or will there be “no money left for climate protection?” We hope that this paper contributes to making the right choices.

2. A Climate of Recovery?

As mentioned above, worldwide, roughly $ 2.7 trillion or 4.7 per cent of world income have been allocated by governments for stimulus packages aimed at remedying the global economic downturn. Part of the money is also intended to put the world economy on a new and sustainable growth path. According to the UNEP roughly $ 750 billion or 25 per cent of the world wide stimulus packages should be invested in so called “green” investments to achieve long-term, sustainable economic growth (UNEP 2009) and to initiate a “Global Green New Deal”. These “green” investments include in particular investments for improving the insulation of public and private buildings, for extending the usage of renewable energies, for improving non-polluting transport, and for generating sustainable agriculture and water management.

All these different measures have of course different impacts on the environment, and are also differently suitable to promote economic growth and employment sufficiently fast. While measures including large investment in the construction sector can possibly yield a high multiplier and also be sustainable from an ecological point of view, they may also take a long time to be approved. On the other hand, direct transfer payments like scrappage bonuses

may be implemented fast, but have limited effects on growth and ambiguous environmental impacts. Measures that are considered well suited both from an economic and ecological perspective and are implementable within a short time span are improvements in grid managements (e.g. “smart grids”), speeding-up of already planned investments in railroad and other public transportation systems and investments in building insulation.[1] Apart from measures that promote climate protection, stimulus packages may also include possibly harmful measures, e.g. expanded road construction. Generally, a proper mix of measures is preferable towards the concentration on individual measures, since capacities are limited, private investments may be crowded-out and the economic and ecological impact of each individual measure is subject to considerable uncertainty.

In practice, the stimulus packages vary considerably from country to country regarding relative and absolute size and composition (cf. again Figure 1). These differences can be explained to some extent by different forecasted economic development in the downturn and fiscal potential to stimulate their economies. As the various countries vary by their initial economic situation at the beginning of the downturn, so do they in their efforts to mitigate climatic change so far. In particular the “green” shares of the United States and China matter with respect to the sustainability of the new growth path, because these two countries are the largest emitters of CO_2 in absolute terms and both showed limited willingness to mitigate climate change in the past. Whereas the European Union (EU) already established an emission trading scheme in 2005 that constantly reduced the assigned allowances to the companies, the United States just recently seem to be increasingly willing to mitigate climate change.

Table 1 presents the “green” share of the worldwide stimulus packages. It shows that 13 per cent of the stimulus packages will be used directly or indirectly for climate protection purposes and approximately another 2.5 per cent will be used for other types of environmental protection. This will save an estimated 111 million tonnes of CO_2 annually.[2] Yet, this amount is less than 0.5 per cent of the actual annual world emissions. Furthermore, even though a significant share of the worldwide stimulus packages is spent for climate protection, the proposed 25 per cent share of the “Global Green New Deal” is missed.

[1] Own appraisal based on Houser et al. 2009. See Klepper et al. 2009 for details.

[2] Estimation based on Houser et al. 2009. See Klepper et al. 2009 for details.

Table 1: Green Shares of the Stimulus Packages Worldwide

		Volume of the stimulus package	„Green“ share for climate protection	Additional „green“ share without climate protection	Annual emission saving
		in billion USD	In %	In %	in Mio. t CO_2[a]
America		1019.2	9.8	1.5	46.9
	United States	972.0	9.9	1.6	45.7
	Rest	47.2	6.9	0.3	1.2
Pacific Asia		1286.5	15.7	4.2	41.6
	China	586.1	29.0	5.2	24.8
	Japan	485.9	2.6	0.0	7.8
	Rest	214.5	9.0	10.9	9,0
Europe		382.1	13.0	0.3	22.4
Africa		7.5	9.5	0.0	0.1
Sum		2695.3	13.4	2.63	111.0

[a]The annual emissions savings were calculated by allocating the measures within the green share to the measures of the study by the World Resource Institute and by multiplying the annual emission saving potential with the actual volume.

Sources: Robins et al. (2009), Houser et al. (2009) and own calculations.

Of the countries listed only China surpasses the required share, spending 29 per cent on climate change mitigation projects and 5 per cent on other environmental friendly projects. This relative large “green” share has to be considered together with the resulting annual CO_2 emission reductions, though. China invests roughly $ 170 billion in climate protection, achieving estimated annual emission reductions of 25 million tonnes of CO_2. This seems rather low at the first glance, e.g. compared to the United States, which invest roughly $ 67 billion in climate change mitigation projects, but achieve annual emission reductions of 46 million tonnes CO_2. Taking into account the high CO_2 abatement potential in China due to its low energy efficiency, the reversed effect would have been expected. However, these estimations do not take into account lots of China’s peculiarities and are thus immensely uncertain. Nevertheless, most of the “green” share in the Chinese stimulus package is spent on improving and expanding the railroad networks and electrical grids. In this context, it is to be expected that this measure will increase capacities rather than efficiency, thus causing emissions to rise rather than fall. Also secondary effects like a possible increase in the burning of coal for electricity generation caused by eased transportation restrictions have to be taken into account. This example shows that the savings could be higher, but that many of the stimulus programmes have considerable potential to save more.

The stimulus packages in the EU are expected to save 22 million tonnes of CO_2 annually, which amounts to approximately 2.5 per cent of the EU’s reduction target for 2020. The reduction in current emissions is expected to amount to about 0.44 per cent, which is about the same reduction that stimulus packages elsewhere will bring about. Almost half of the

reductions in the EU (9.5 million tonnes) are expected to be brought about by the EU Commission's stimulus packages. Another 35 per cent of the reductions (7.6 million tonnes) are expected to be brought about by the German stimulus packages.

The expected emission reductions are, however, subject to a great deal of uncertainty. In many cases, the stimulus packages have not been defined very well yet. Even more, there is often also a certain share of climate-harming measures in the stimulus packages, e.g. energy vouchers, increased spending on road construction or suspension of tolls. Consequently, it is difficult to estimate the effect the stimulus packages will have on energy use and emissions. Additionally, the estimated range of the "green" shares in the stimulus packages varies considerably depending on the final design. Figure 2 shows the variations and possible range of the most important stimulus packages in the EU.

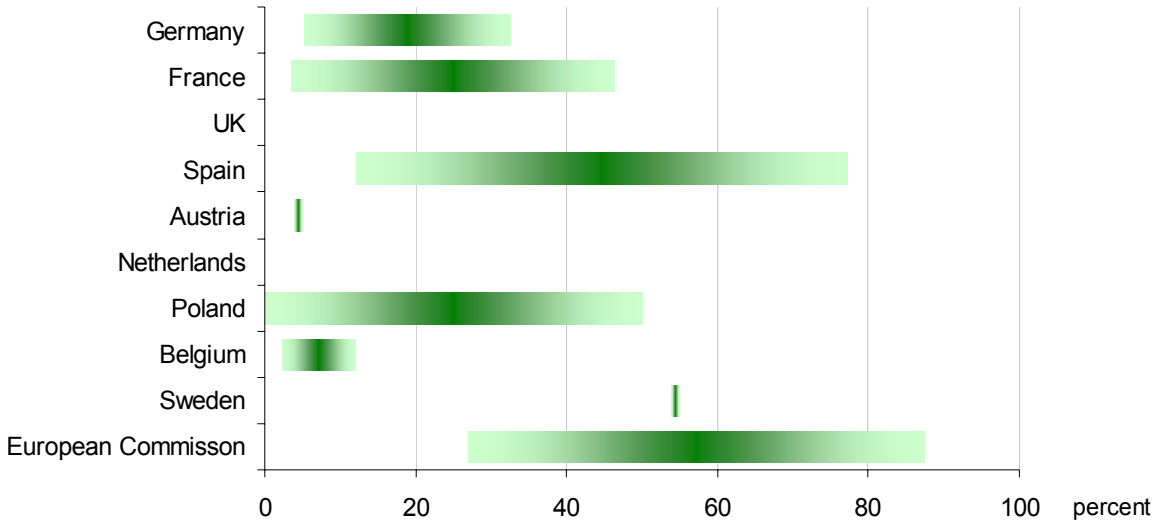

Figure 2: Potential green share of the stimulus packages in Europe

Due to the large estimated range of the "green" share in the stimulus packages, there is still the opportunity to make them "greener." The measures financed by the stimulus packages are still in the process of being formulated in detail. Thus it would be possible to increase the "green component" of the packages in the EU that have already been approved to 35 per cent. If all of the stimulus packages in Germany were to be designed to be "green", 32 per cent of the appropriated funds could be used for climate protection purposes this year. If, on the other hand, climate protection was not to be given priority, the amount available for climate protection purposes could fall to 5 per cent. These figures show the great extent of uncertainty in the evaluation of the stimulus packages' impacts. However, what is certain is that stimulus packages alone, however good they might be designed, are not the "magic silver bullet" that cures the world from the multiple threats of climate change and economic downturn. In the medium and long run, only a significant change of the world economy's structure, induced by severe GHG-mitigation and adaptation efforts, will prevent the climate crises.

3. No Power Left for Climate Protection?

After the previous section analysed the environmental impacts of the national stimulus packages, we now take a broader look at current national and transnational climate protection legislation in the face of the global financial and economic crisis.

One example where the global financial and economic crisis is explicitly taken as an excuse to postpone climate policies is Australia. With a reference to the global recession, the installation of a market-based cap-and-trade programme was postponed for 12 months in May 2009 (cf. Reklev 2009a) and the carbon pollution permit cost was fixed to A$ 10 in the first year (from 1 July 2011 to 30 June 2012). In August, the Senate voted against the carbon trading bill but the government may submit a revised form of the bill to parliament later in the year (cf. McGarrity 2009a). Finally, energy-intensive industries benefit from a global recession assistant package so that altogether there are now several breaks for these industries. Yet, there are also positive signs and the Australian government, led by centre-left Prime Minister Kevin Rudd, announced on May, 18th 2009 that it planned to build the world's largest solar energy plant with an output of 1000 megawatts at the cost of A$ 1.4 billion as part of a A$ 4.65 billion clean energy initiative (cf. Fox 2009) and the parliament voted in August in favour of a 20 percent target for electricity from renewable sources by 2020 (cf. McGarrity 2009a). Altogether the current Rudd Administration still seems to be more determined to achieve a meaningful post-Kyoto document at the Climate Change Conference in Copenhagen compared to the former Howard Administration that did not agree to ratify the Kyoto Protocol (cf. Aldy and Stavins 2007, p. 10) and refused to install an emission trading scheme in 2007, even when the Australia's states voted to cut carbon dioxide emissions and fight global warming.

In other countries the effects of the global financial and economic crisis on climate policy are less explicit. In the United States, the world's largest emitter of carbon dioxide per capita, the 2008 US-American presidential elections of Barack Obama were possibly a cornerstone in the global fight against climate change. In his campaign Obama promised to turn around the lax environmental policy of his predecessor, former US President George W. Bush who, like Australian former Prime Minister Howard, did not agree to ratify the Kyoto Protocol (cf. Aldy and Stavins 2007, p. 10). Today though, after the outbreak of the crisis and updated prospects of a global recession, the outcome of a firm and determined environmental policy, including an effective and efficient emission trading scheme, is uncertain. President Obama's proposed plan to fully auction the permits of the future cap-and-trade scheme (cf. Zabarenko 2009) is opposed by Republican representatives and seems to get watered down by Democrats who represent heavily affected states. Representatives amended the hundred per cent auctioning clause in the Waxman-Markey bill and it was also included to give away permits to energy-intensive industries for free. The overall target of a 20 per cent emission reduction relative to 2005 was reduced to 17 per cent and means almost no reductions relative to 1990 (cf. Carroll 2009). Still, the Obama Administration seems to have generally convinced Congress of the importance of stricter environmental policy. Likewise, President Obama prom-

ised more cooperation in international negotiations for a post-Kyoto climate change treaty, which is essential for a successful outcome of the Copenhagen negotiations as a whole due to the leadership role of the United States and its position as largest per capita contributor to climate change.

In the EU the so-called "climate package" that defines rather ambitious climate polices is under discussion already since 2007/2008. It includes a reduction of GHG emissions of at least 20 per cent (relative to 1990) until the year 2020 that is increased to 30 per cent if other developed countries undertake comparable reduction efforts. Furthermore, the EU's climate package includes a 20 per cent share of renewable energies in the EU's energy consumption by 2020, a 10 per cent minimum target for the market share of renewable transport fuels and improved rules for the European Emissions Trading Scheme (ETS). The aim is in particular to decrease the number of emission allowances and to make the carbon dioxide emission market more competitive. The global financial and economic crisis has fortunately not delayed the legislation and the climate package was ultimately adopted by the European Council in April 2009 (European Union, 2009a and 2009b) and entered intro force in June 2009. Yet, the final adopted text contains some concessions for European industries and it is not unlikely that the success of industry lobbying was influenced by the global recession. The main concession was the reduced auctioning of allowance where the European Council as well as a majority of parties in the European Parliament did not follow the Commissions proposal for full auctioning. Moreover, coal industry lobbying achieved that coal-fired power plants do not need to obey maximum carbon dioxide emission standards (cf. EurActiv 2009a). This policy is particularly favourable to Eastern European member states like Poland which produces 90 per cent of its electricity by coal-fired power plants and leaves space for the construction of high emitting coal-fired power plants in the future (cf. EurActiv 2009a).

Evidence of impacts of the global recession on climate policy in other countries and regions is even more speculative. Japan decided in June 2009 to reduce its emissions by 8 per cent compared to 1990 levels by 2020 (cf. Tabuchi, Hiroko et al. 2009) which is only slightly more than the 6 per cent reduction by 2012 of the Kyoto Protocol. The same is true for Russia that also declared a new "goal" on climate protection in June 2009 and aims at a 10 to 15 per cent reduction after 2012 compared to 1990 levels (cf. McGarrity 2009b). Since in 2007 Russia in fact emitted 34 per cent less compared to 1990 levels this so-called climate protection "goal" is simply meant to state that Russia regards the development of further energy-intensive industries and power plants as its historical right, since the collapse of the former Soviet industries was the main reason for the great reduction after 1990. Russia's weak "goals" by themselves probably did not change due to the global financial and economic crisis, yet it is assumable that the crisis and the little leeway for investment reinforced Russia's determination not to share the costs of climate protection.

China, which is meanwhile the greatest emitter of CO_2 in absolute terms, has generally recognised the importance of emission reductions and demonstrates willingness to control GHG emissions and to invest in more environmental-friendly technology. Partly this willing-

ness is driven by the clear signs of environmental degradation in Chinese cities and the agricultural sector, and by the fear of social unrest against the regime's current environmental policy. A main reason is also China's position in the global race for green technology production. Policies include a subsidy for solar capacity installed in 2009 by $ 3 per watt, subsidies for the infant Chinese electric car industry, and cooperation on green technology with US-American and European companies. The Chinese government moreover aims to increase the share of renewable energy from 16 per cent today to 23 per cent in 2020 (cf. Aston 2009). A good sign is also that in April 2009 the Chinese government considered for the first time to set a reduction target for GHG emissions (CO_2-Handel, 2009a).

Positive news in terms of national climate policies include the legislations in Mexico and South Korea. In June 2009 Mexican President Felipe Calderon announced that Mexico aims at a 50 per cent reduction of carbon dioxide in 2050 compared to 2000 levels (cf. Volcovici 2009a). To begin such an ambitious path, Mexico aims at an 8 to 16 per cent reduction of carbon dioxide until 2012 and increases its investment in restoring deforested land. Meanwhile South Korea which is part of the Four Asian Tigers, member of the G20 and thus can be considered a young developed country plans to pass legislation for a national ETS soon (cf. Reklev 2009b). The planned bill would also include the investment of billions of Euros in energy efficiency over the next ten years. During the last decades South Korea has grown to be one of the ten largest emitters of GHGs on the planet. Its current legislation is a good beginning for future climate negotiations.

Altogether, even though the direct effects of the global financial and economic crisis on climate policies are often rather speculative, we thus find at least tendencies to alter or postpone climate protection legislation in different important countries and regions, although there are also small positive news and although in principle the urgency to combat climate change remains acknowledged everywhere.

4. Prospects for the post-Kyoto Negotiations

Even more important than the effect of the global financial and economic crisis on national climate policies is the question whether the crisis will have an impact on the international climate regime negotiations. As was mentioned already in the introduction it is necessary for global emissions to peak within in the next few years and an international follow up-agreement of the Kyoto-Protocol with stringent emissions reductions is urgently needed. The decisive negotiations take place in December 2009 in Copenhagen and since it can be expected that developed as well as developing countries are far from full recovery from the global financial and economic crisis at the end of 2009, this might indeed be a bad timing.

Generally, the difficulty to agree on an international climate regime is not only due to the public goods property of the atmosphere but also due to large international asymmetries. Industrial countries on the one side are responsible for almost 80 per cent of cumulated indus-

trial GHG emissions up to date and have per capita emissions that are 5 to 200 times larger than those in many developing countries. For example, per capita emissions of ca. 20 tCO_2 in the USA and ca. 10 tCO_2 in Germany stand in contrast to ca. 4 tCO_2 per capita emissions in China, ca. 1.2 tCO_2 in India and less than 0.1 tCO_2 in many African countries. The developing countries on the other side will suffer most from the adverse effects of climate change. Against this background it is comprehensible that representatives from the developing countries argue that mainly the developed countries should pay for climate policy and reduce their high per capita emissions. The developing countries themselves are not willing to endanger their development process by strict emission targets. Yet, stringent emission targets can only be achieved if the developing countries, that are expected to contribute to more than two thirds of GHG emission growth in the next 30 years, also control their emissions. In addition, abatement costs are less in these countries. A final important issue is technology. Even if per capita emissions are low in developing countries energy is often used very inefficiently. The same global production could be produced with only half the GHG emissions if all economies would have the same low energy intensity (the amount of energy to produce e.g. a good or service worth $ 1) as e.g. Germany. The potential for emission saving technologies and the potential for innovation exist mainly in the developing countries. A potential international agreement thus needs to have a least three main components: (1) emission targets, (2) mechanisms for and finance of technology transfer and (3) funds for adaptation measures in developing countries.

Concerning emission targets the result of the negotiations in 2007 in Bali that have been acknowledged several times envisage global reduction targets of 25 to 40 per cent (relative to 1990) by 2020 and reductions of 50 per cent by 2050 (see e.g. Oxfam 2009). The group of developing countries (G77, China) demands at least 40 per cent reductions from developed countries as they hold historical responsibilities (cf. EurActiv 2009, Oxfam 2009). Representatives from Small Island States fear that their territories will disappear due to rising sea level and demand even 45 per cent reductions. Compared to these targets, the existing national targets (as mentioned also in Section 3) are far from ambitious. The EU aims at an overall 20 or 30 per cent reduction, the US aim at virtually no change compared to 1990, Japan aims at 8 per cent reductions, Russia aims at 10 to 15 per cent reduction, Australia aims at 2 to 24 per cent reductions, and Canada aims at a 2 per cent increase (cf. Oxfam 2009, McGarrity 2009b).

The Bali Action Plan also introduces the term of “common but differentiated responsibilities” that not only included “measurable, reportable and verifiable nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives, by all *developed country Parties*”, but also “measurable, reportable and verifiable nationally appropriate mitigation actions by *developing country Parties* in the context of sustainable development” (cf. UNFCCC 2007). The EU demands that the developing countries reduce their emission by 15 to 30 per cent by 2020 compared to a business as usual path that has yet to be defined. This is rejected by the developing countries, even though these reductions are physically necessary to reach the overall targets. It is still open, what kind of targets the

major developing countries including China, India and Brazil are willing to accept. In any case this will depend crucially on the other two issues and the willingness of the developed countries to provide financial funds for technology transfer, adaptation measures and emission reductions.

In this context Mexico is promoting a plan to create a global climate fund which is financed by all countries (except the poorest) based on GDP, population and level of emissions. Representatives from developed as well as developing countries already signalled that such a fund could be a feasible solution in the negotiations (cf. Volcovici 2009b and Harrison 2009a). Still representatives from India, China and other developing countries underline the "common, but differentiated responsibilities" of developed and developing countries (cf. Kruppa 2009 and EurActiv 2009b) and demand that the developed world pays "the full cost" (cf. Kruppa 2009) of adaptation of the developing world. Current budget estimations for a global climate fund are about $ 10 billion annually (Volcovici 2009b). This seems to be a rather low estimate, compared e.g. to the draft report by the finance ministers of the European Union (cf. Harrison 2009b). The finance ministers estimate that annually € 100 billion (≈ $ 142 billion) are needed from 2020 on to reduce emissions by 30 per cent below business as usual levels in the developing countries. Additional they conclude that € 20 to € 50 billion are necessary for adaptation measures (cf. Stabroek News 2009). Following some criteria on burden sharing the NGOs Oxfam Germany and BUND (Friends of the Earth Germany) argue that the developed countries should pay 75 per cent of the emission reductions in the developing countries or ca. € 70 billion (≈ $ 100 billion) annually (cf. Oxfam Germany, Friends of the Earth Germany 2009, p. 8). They also demand that additionally and additional also to existing development aid € 40 billion (≈ $ 57 billion) are needed annually for adaptation measures.

Whether developed countries will commit themselves to such larges payments over several decades becomes especially questionable in times of the global economic and financial crisis. Even the EU that always aims to show leadership in climate policy has postponed a decision on the funds they are willing to provide until October 2009. What is very illustrative in this context is to compare the green shares of the stimulus packages described in Section 2 to the estimates of the EU and Oxfam. As described above of the altogether $ 2.7 trillion that have been earmarked globally for stimulus packages ca. 13.4 per cent or $ 361 billion are likely to go to climate friendly measures. Out of these ca. $ 160 billion originate from developed countries. Thus, with the help of the stimulus packages the developed countries managed to mobilize for on one-time the sum that has to be transferred to developing countries annually for several years. And not only is the money from the stimulus packages a one-time investment, it is also intended for measures in the national economies of *developed countries* while for an international climate treaty reoccurring expenditures for *developing countries* are needed.

Concluding, mitigation of the effects of the global financial and economic crisis demands resources unimaginable before the crisis. As a result, it is doubtful whether world leaders will set ambitious targets for a post-Kyoto agreement in Copenhagen in December 2009, since

reaching ambitious targets entails costs that are likely to be beyond the current willingness to pay of both developed and developing countries. Still, the future costs of not coming to an agreement might go far beyond the negative effects of the global recession and even though the sums seem and are large, $ 160 billion is only 0.004 per cent of the annual GDP of the high income countries (in 2006 numbers) (cf. World Bank 2008).

5. Summary and Conclusions

There is some danger that the current global financial and economic crisis will delay necessary climate policies worldwide even though the adverse effects of climate change are likely to be much more far reaching for the economic well-being, human development and prosperity than the current economic downturn. To avoid dangerous anthropogenic climate change (article 2 of the United Nations Convention on Climate Change) GHG emissions have to peak within the next few years and decline to about 50 per cent compared to 1990 levels by mid-century. This requires that immediate action to decarbonise our societies is undertaken. This urgency does not vanish, because the global recession slows down emission growth for one or two years. Long term sustainable economic growth requires that we restructure our economies towards a more sustainable way of producing and consuming energy. There are a number of voices that call for increased climate action as an answer to the double crisis of economic recession and dangerous climate change.

Indeed there are some signs that the crisis is increasing the national funds that are made available for climate protection. But there are also signs that the crisis is taken as an excuse to postpone necessary structural change and to fail to generate reasonable funding for climate mitigation and adaptation measures especially in the developing world.

The positive signs are mainly the large economic stimulus packages of altogether $ 2.7 trillion or 4.7 per cent of global GDP that are allocated to remedy the global economic downturn by governments all around the world. Around 13 per cent or $ 361 billion of this money is spent for “climate friendly” investments which saves around 111 tonnes of CO_2 annually. Yet, this amount is less than 0.5 per cent of the actual global emissions. And not only is the share of 13 per cent for green measures only about half of the 25 per cent share that the UNEP proposed in its “Global Green New Deal”, also the measures that are financed with this money are not necessarily those that are most effective for quickly stimulating the economies and for saving emissions. These would be mainly improvements in energy efficiency of public and private buildings and improvements in grid management. While for example the EU and the United States are at least investing large parts of their “green” funds into these measures, China mainly invests in the railway network capacity extension which saves relatively few emissions per dollar. Additionally, counterproductive measures like fuel subsidies or heating vouchers offset the saved emissions by “green” measures”. However, by earmarking the still “free” share of the stimulus packages for climate investment can significantly increase the amount of annually saved emissions.

Even in the best case though, the green funds cannot replace a long term sustainable climate policy. If we look at current national efforts, we will also get a mixed picture. There are at least some positive news even in times of global recession. For example China considers explicit emission targets for the first time, the EU passed its climate package that aims at reducing its GHG emissions by at least 20 per cent (compared to 1990) by 2020 and the United States are likely to agree on concrete reduction targets. Yet, there are also clear negative developments where climate policies have been postponed – such as the Australian emissions trading scheme – or watered down at least partially – such as the new rules for permit allocation in the EU emissions trading scheme and the US reduction targets. In Australia the global financial and economic crisis has served as an explicit argument for the delayed trading scheme, while in the other countries it is also likely that the crisis has increased the credibility of industry lobbying for less stringent policies.

While national action including national funds for climate mitigation from the stimulus packages and national legislation is clearly important for reaching ambitious climate targets, the most important step is an agreement on a new international climate regime as a follow up of the Kyoto Protocol that expires in 2012. This agreement needs to include at least the major emitters also from the developing world. The Bali Action Plan from 2007 sets the path by asking for "measurable, reportable and verifiable nationally appropriate mitigation commitments or actions, including quantified emission limitation and reduction objectives, by all *developed country Parties*" (cf. UNFCCC 2007). Yet it also states that "measurable, reportable and verifiable nationally appropriate mitigation actions by *developing country Parties* in the context of sustainable development" (cf. UNFCCC 2007) are necessary.

Developed countries are responsible for the major share of past GHG emissions, have the highest per capita emissions and the highest welfare. Developing countries have low per capita emissions and suffer most from the adverse effects of climate change. Fairness requires that developed countries bear the largest burden of emission reductions and also partly pay for emission reductions in the developing countries. In this context an international climate fund has been proposed to which especially the developed countries should contribute and which will be used for climate protection and adaptation measures in developing countries. Representatives from developed as well as developing countries already signaled that such a fund could become a feasible solution in the negotiations and many experts stress the importance of large monetary transfers from developed to developing countries for an agreement. Estimates of the necessary size for such a fund vary. The EU estimates that annually ca. € 100 billion are necessary to sufficiently reduce emissions in developing countries. Additionally, ca. € 20 to € 50 billion are needed for adaptation measures. Approximately, this implies that the developed countries would have to annually transfer as many resources to developing countries as the green shares of their current stimulus packages. These are clearly large sums and there is the real danger that the global economic and financial crisis comes at the wrong time for the negotiations in Copenhagen in December 2009.

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