

FUNDING SOURCES FOR INTERNATIONAL CLIMATE POLICY

A CRITERIA-BASED ANALYSIS OF THE OPTIONS
DISCUSSED UNDER THE UNFCCC

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Summary

Delivering substantially increased new and additional, adequate, predictable and sustainable financial resources will have to be a key outcome of the UNFCCC negotiation process towards an international climate change agreement to be achieved in Copenhagen by the end of 2009. Resources are required to assist developing countries in mitigating emissions (incl. REDD) and adapting (incl. insurance) to the adverse consequences of climate change. During the last year, a number of countries have made proposals for instruments that could deliver a certain amount of financial resources.

This briefing paper analyses seven key approaches that have been proposed and judges them against a number of politically relevant criteria. As a conclusion, the international sale of AAs, through auctioning a share or selling it at a fixed price, appears to be the most favourable option, ideally in combination with approaches to generate resources from the sectors international aviation and maritime transport. However, there are still unanswered legal and technical questions regarding the different proposals which would require further investigation.

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Summary for Policymakers

The international response to climate change and the negotiations in the context of the United Nations Framework Convention on Climate Change (UNFCCC) are not only crucially dependent on the definition of reduction targets and action obligations, but also on the provision of additional financial resources for mitigation (*inter alia* for the reduction of tropical deforestation), technology cooperation and adaptation to the consequences of climate change in developing countries. Available studies so far agree in their conclusion that the carbon market will not be sufficient to cover the additional annual costs of hundreds of billions that are necessary for keeping global temperature rise as far as possible below 2°C as compared to pre-industrial levels. Moreover, emissions trading instruments (including the flexible mechanisms under the Kyoto Protocol) do not directly generate funding for measures to adapt to the unavoidable impacts of climate change. (Nevertheless, financing options that are linked to the emissions market, such as the sale or auctioning of emission permits involving governments or the private sector, may serve as a key source of funding.)

Another point is that the Bali Action Plan creates an explicit, political interdependency between the measurable, reportable, and verifiable (MRV) climate efforts in developing and newly industrialising countries and the equally measurable, reportable and verifiable enabling support measures by industrialised countries in the form of technology cooperation, financing and capacity building. The establishment of this link was the crux that almost led to the failure of the Bali negotiations.

That is why in the UN negotiations as well as in the research community multiple approaches to generating additional resources on a sufficiently large scale are discussed at the moment. This briefing paper will thoroughly analyse these suggestions with regard to multiple criteria that determine the effectiveness, efficiency and equity of the different instruments with regard to the generation of resources, and that can be derived from existing, legally binding agreements under the UNFCCC and the Bali Action Plan. Despite the large variety of suggestions it may be strategically preferable to focus on one main instrument or at best a combination of logically connected instruments, since a considerable resistance to the introduction of new financing instruments must be expected. In doing so it is important to test whether certain options are able to generate resources even before a new climate treaty will enter into force in 2013 because developing and newly industrialising countries will need short-term support for the implementation of their climate-friendly development strategies and immediate adaptation measures. Global emissions will have to peak before 2020 – so no time must be wasted!

All in all, the authors draw the following conclusions:

1. “First-best”-option is the international sale (auctioning/fixed price) of Assigned Amount Units (AAUs, Option 4); it

- can generate sufficient resources in addition to existing mechanisms (particularly Official Development Assistance, ODA) if designed appropriately;
- creates an “automatic“ funding mechanism;
- implements the polluter-pays principle and thereby creates incentives for further reducing greenhouse gas emissions;
- basically represents an upscaling of the EU’s current approach (auctioning combined with earmarking of the revenues);

- guarantees that all industrialised countries contribute their fair share (i.e. all countries that will be assigned absolute reduction targets in Copenhagen). The countries that are not assigned absolute reduction targets in Copenhagen can be also included through e.g. sectoral agreements;
- is consistent with the structural approach of the Kyoto Protocol but at the same time broadens it by enabling the inclusion of newly industrialising countries through sectoral agreements;
- is technically relatively easy to implement.

How governments generate the resources required to purchase the AAUs needed remains in their domain. For example, it can be used to further incentivise emission reductions on a sub-national level by generating the necessary revenues through domestic emission trading auctioning which sets a price for private companies.

In the negotiations, this instrument is being discussed with increasing frequency by several countries and it aligns well with the ultimate objective of the UNFCCC, which is basically the provision of a public good, namely the avoidance of dangerous climate change (Art. 2 of the Convention). The international sale of emission permits is the one option that enables an internationally consistent approach and generates resources that are additional to existing government funding.

However, since emission allowances would not be given out for free anymore, governments may be incentivised to commit to less ambitious reduction targets. This evasive behaviour could be effectively avoided by increasing the share of costly AAUs up to 100 percent (in this case possibly at a lower price). The affected revenue stream could moreover be insulated from market price volatility by choosing to sell allowances at a fixed price instead of auctioning them off, or by other arrangements to limit the volatility.

To date international aviation and maritime transport are not yet covered by the Kyoto-Protocol but the EU strongly and rightfully supports its inclusion to ensure its environmental integrity. It follows from the polluter-pays principle, equity considerations and the sheer volume of required revenue inflows that these sectors should be obliged to contribute – ideally through their inclusion in an emissions trading system with auctioning of the allowances. Considering the negative experiences made in the past with the climate policies of the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) it is important to ensure the UNFCCC's strong role in this process.

Several arguments therefore indicate the advantages of international sales of AAUs combined with the inclusion of international aviation and maritime transport. The latter component can thereby be understood as a logical extension of the former as international aviation and maritime transport are relevant sectors that up to now are excluded from national emissions budgets. It is, however, possible to exempt flights to certain regions, for example, to the Least Developed Countries or the Small Island Developing States, from the auctioning system and impose a certain charge per ticket instead. In this context it is of particular political relevance that the group of Least Developed Countries, containing at the moment 48 countries, support a global aviation level to generate resources for adaptation measures.

2. The second best solution seems to be the **auctioning of allowances within regional/national emissions trading systems (ETS)** and the earmarking of the revenues for international purposes. This approach also promises significant financial flows and it provides additional incentives for reducing emissions. Nevertheless, the costs are solely incurred by the affected sectors in those countries that are included in an ETS.

Calculations reveal that this approach has the potential to generate even higher financial flows than the auctioning of AAUs if the share for sale of AAUs is assumed to be lower than 10 percent. According to the EU Commission's initial proposals, in the EU alone up to EUR 50 billion could have been generated through 100 percent auctioning. The ETS only incorporates about 50 percent of the AAUs in the EU, while some of the models currently discussed in the USA even suggest the auctioning of all permits covering all sectors of the US economy. However, for the purpose of this paper, which are the contributions to international climate finance, the important factor is the share of revenues that is earmarked and then delivered for international climate protection. In the case of the EU, it has not been exactly determined which share or sum of the revenues will be used for international purposes, but there is little doubt it will be significantly less than 100%.¹

Notably, the second best option could complement the first best solution if governments would decide to pass on the ultimate cost burden to the private actors participating in the trading scheme. Moreover, it is theoretically feasible to exempt those countries from the auctioning of AAUs that have already implemented national or regional emissions trading systems for funding purposes. This approach, however, would only be favourable if these funds were bindingly earmarked by international law and, if necessary, the percentage that is used for international climate funds is adjusted.

Another interesting approach is to use option 1 as non-compliance instrument for option 2. If countries do not deliver their fair share via auctioning of allowances at the end of the year, the equivalent amount of AAUs could be auctioned internationally in the following year.

3. The use of general national budgets for international climate policies (Option 1) only complies with the polluter-pays principle in case contribution criteria are defined accordingly. Only through these criteria may the instrument provide additional incentives for further emissions reductions because the ultimate source of funding generally remains open (as it is the case in AAU auctioning). Additional enforcement rules – particularly a credible sanctioning mechanism – would be necessary to build sufficient trust in the realisation of the set targets. (Again option 1 could be an interesting complement as a compliance mechanism). The relation of trust in this approach has diminished in the past due to the high rate of non-compliance with the again and again promised 0.7 percent target for ODA for long time. Hence, this option must always be seen in combination with other instruments that additionally safeguard accordance with the polluter-pays principle and determine who ultimately bears the costs.

4. A carbon tax (Option 6) is a very attractive option in theory. However, it is likely to encounter strong resistance from national governments due to sovereignty concerns.

5. All other financing options are dependent on specific circumstances and could at the most be used to complement other funding mechanisms.

6. Negotiations on the introduction of a tobin tax (Option 7) under the UNFCCC cannot be expected, but maybe in other fora. As it has been discussed in the past, it may be an option to increase non-climate ODA flows.

The following table summarizes the evaluation of the different instruments with regards to the multiple criteria that will be further elaborated on in chapter 2.

¹ Germany for example provides around 30% of the revenues that are used for climate purposes to international measures (and about half of overall 2008 revenues have been used for climate change related activities).

Summary Table

Option	a) Expected revenues ²	b) Predictability	c) Climate impact and compliance with the polluter-pays principle	d) Effects on competition	e) Interference with national sovereignty and political feasibility	f) Additionality
1 Resources from general national budgets	<p>++ Two- or three-digit billions possible: e.g. G77 and China proposal: flows at the level of 0.5-1% of GNI of Annex I countries USD 201-402 billion³</p>	<p>- Predictability depends on legally binding character; it is expected that not all Parties will continuously give sufficient relevance to climate change and vary their payments according to current circumstances.</p>	<p>+ Reflects polluter pays principle. + Provides an incentive for further reduction at the international level, if level of emissions is used as one key factor determining national contributions</p>	<p>+ In principle neutral for competition between nations, if all relevant countries are included; - May create unfair competition among certain sectors in one country depending on the national revenue generation approach.</p>	<p>- Strong and direct interference since the duty to contribute to the funds is internationally determined. - Political feasibility depends on the scale of order and national revenue approach. (Political feasibility of a stringent compliance regime is very low)</p>	<p>- Counting the contribution under the option in achievement of the ODA target is relatively likely. - Diversion of existing aid may also take place. + if above agreed binding „baseline“ towards 0.7%ODA target in 2015</p>
2 Extension of the levy on flexible instruments (“share of proceeds” from CDM, JI and possibly from the trade in AAUs)	<p>- Far below the needed resources: e.g. at 2 % levy (CDM) in 2020 USD 0.2 to 0.69 bn. At 3 to 5% levy in 2020 USD 0.3-1.7 bn. Even if it is extended to all flexible mechanisms: between USD 0.30 and 2.2 bn.⁴</p>	<p>+, „Automatic“ generation is ensured, „earmarking“ for climate change purposes may be permanent; however, the amount of resources depends on market development and therefore is hardly predictable.</p>	<p>O Rather neutral. For companies purchasing credits it partially applies the polluter pays principle, since only polluters have to purchase. O A (relatively low) reduction of „low-cost“ mitigation options in developing countries, no steering effect for climate protection</p>	<p>+ No negative impact on competition between sectors. O Slightly unfair competition in existing situation, where only CDM is levied</p>	<p>+ Indirect interference + Politically feasible, but probably requires amendment to Kyoto Protocol.</p>	<p>++ Counting the contribution under the option in achievement of the ODA is difficult because it is a new market-based source on international level.</p>
3 Auctioning of emission allowances (national or regional)	<p>++ Two- or three-digit billions possible: According to original European Commission estimate up to EUR 50 bn in 2020. But this does not include the exemptions recently decided for the third phase EU ETS and the uncertainty over the share of internationally provided revenues</p>	<p>- The coverage may be small in the beginning. And it is difficult to foresee which developed (and developing) countries will introduce ET schemes with auctioning. + The above defect could be overcome in combination with option 1. - The amount of resources is unpredictable due to volatility of CO₂ market price.</p>	<p>+ Reflects polluter pays principle (but only for sectors included). + Provides an incentive for reduction through price signal.</p>	<p>+ Neutral for competition within the sectors included in the ETS. - May have a negative impact on competition between sectors across borders, depending on design of national systems</p>	<p>- Very strong interference in the case of internationally binding earmarking. O Politically more feasible than options 4 and 5 since earmarking is „just“ needs to be added where ETS already exists. However, ETS does not exist in all developed countries</p>	<p>- Counting towards ODA targets is likely. - Diversion of existing aid is also possible + if above agreed binding „baseline“ towards 0.7%ODA target in 2015</p>

² Indicative amount, depends on various variables

³ FCCC/TP/2008/7, p. 13

⁴ FCCC/TP/2008/6, p. 6

Option	a) Expected revenues ²	b) Predictability	c) Climate impact and compliance with the polluter-pays principle	d) Effects on competition	e) Interference with national sovereignty and political feasibility	f) Additionality
4	<p>++ Two- to three-digit billions possible, depending on share sold and market development (ca. USD 52 bn at 7.5%)⁵. Predictability increased with fix price, but probably less revenues than from the more volatile auctioning</p>	<p>++ Automatic generation is ensured when agreement enters into force. + 100% selling at fixed price could help minimising strategic behaviour of Parties for lower reduction targets. + Sale for fixed price also increases predictability, but probably provides less revenues than a more volatile auctioning</p>	<p>+ Provides an incentive to CO₂ reduction through early price signal, but so far only for Annex I countries [in principle extension to countries without national targets through sectoral emission trading agreements is possible]</p>	<p>0 Neutral on competition among countries with reduction targets if same share has to be purchased - May distort competition in the (relatively few) sectors which are in competition with sectors in non-target countries, if these are not covered through sectoral agreements.</p>	<p>- Strong interference with national sovereignty - Low political feasibility because it affects all countries in need of AAUs + High political feasibility for the countries that already introduce ETS. E.g. for the EU, it is just „scaling-up“ of its ETS plus earmarking for international purposes.</p>	<p>++ Since it targets internationally generated good (AAU), counting the contribution towards ODA target is not reasonable, but also not impossible - if auctioning does not take place at the international level but in the domains of national governments, it may be counted towards ODA, + if above agreed binding „baseline“ towards 0.7% ODA target in 2015</p>
5	<p>+ Existing studies estimated low two-digit billions (USD), depending on design</p>	<p>Levy: ++ Predictability is better with fix levy ETS inclusion: + Carbon price is probably more volatile than factors that impact on demand for aviation and shipping</p>	<p>Levy: + Provides an incentive for further reduction if the rate is set appropriately ETS inclusion: + Provides an incentive through price signal.</p>	<p>Levy: ++ Neutral if comparable levies in relevant countries, if all relevant sectors are included; ETS inclusion: + neutral if in relevant countries all competition relevant sectors are included. + In case of inclusion of aviation and maritime transport distortion in Kyoto Protocol – regarding reduction targets and funding – is stopped. Ideal as complement to 4 and 6.</p>	<p>+ Impact is limited since private sectors and individuals are being affected; 0 political feasibility is low with global approach</p>	<p>++ Additional to ODA target if it is raised independently in national budgets.</p>
6	<p>++ Two- to three-digit billions possible, depending on design: e.g. at USD 2 per tonne CO₂ with an exemption of 1.5 t CO₂ eq per inhabitant approx. USD 48.5 bn annually (proposal tabled by Switzerland).⁶</p>	<p>++ if fixed tax rate, depending on binding character of UN climate policy framework</p>	<p>+ Provides an additional incentive for CO₂ reduction through price signal</p>	<p>++ Theoretically optimal to avoid distortion in competition, if comparable tax rates on all emissions</p>	<p>- Strong interference with sovereignty. - Low political feasibility</p>	<p>- Counting in ODA as well as diversion of existing ODA are likely to happen + if above agreed binding „baseline“ towards 0.7% ODA target in 2015</p>
7	<p>++ Two- to three-digit billions possible, depending on design; USD 15-20 bn p.a. (at tax rate of 0.01%)⁷</p>	<p>+ Automatic levy, volume dependent on market development - doubtful if „earmarking“ for climate purposes would be accepted, has also been discussed as ODA generating instrument</p>	<p>- Does not provide an incentive, without specific climate change reference</p>	<p>- May distort financial market</p>	<p>+ Indirect interference with sovereignty. - Implementation in the UNFCCC context very unlikely</p>	<p>++ Independent of national households</p>
	<p>++ if two- to three-digit billions possible</p>	<p>++ if amount is clearly predictable and if „domestic revenue problem“ is overcome</p>	<p>+ if emissions are a key indicator and if additional incentive to reduce emissions</p>	<p>+ if no unfair competition; - if unfair competition</p>	<p>+ if no principal sovereignty concerns - if such concerns, possibly due to national constitutions</p>	<p>++ if new source and additional to 0.7% ODA target; - if counting towards 0.7%-ODA target unlikely</p>
	<p>Explanations + positive - negative 0 neutral</p>					

⁵ Oxfam, 2008

⁶ FCCC/TP/2008/7, p. 13

⁷ UNFCCC, 2008a

1 Introduction to the role of new and additional funding mechanisms

The findings of the IPCC and the Stern review clearly demonstrate that the investments that are necessary to prevent highly dangerous climate change are below the cost of dealing with the consequences of doing nothing.⁸ Nevertheless, cost estimates predict a need for additional financial resources that amount to hundreds of billions to fund mitigation measures, including the “Reduced Emissions from Deforestation and Degradation (REDD)” and technology cooperation as well as measures to adapt to the adverse climate impact in developing countries including a multilateral climate insurance instrument.⁹ The G77 and China refer to these estimates indirectly when claiming in the international climate negotiations that the level of new and additional funding per year must at least be as high as 0.5 to 1 percent of total GDP of the Annex-I (industrialised) countries (approximately equal to annually USD 201 to 402 billion).¹⁰

1.1 *Mitigation and the limits of the carbon market*

The scientific as well as the political debates about new and additional financing options for mitigation are undertaken with the recognition that international public funds should be designed to increase an absolute amount of resources provided by the funds but also to specify the roles of public and private funding for effective use of the same amount of resources. In fact, the major share of the required investments in emissions reductions has to be made by private actors, for example through Foreign Direct Investments in developing countries.¹¹ Nevertheless, the relative contributions of public and private funding differ significantly across purposes, i.e. depending on whether one looks at technology cooperation, REDD, adaptation or insurance and also across target countries, i.e. whether one looks at emerging economies, Least Developed Countries (LDCs), or other developing countries.

Particularly in the area of mitigation (with the exception of LDCs) the main challenge is considered to be the mobilisation and diversion of large-scale private investment flows towards low-emitting and low risk forms of electricity generation and enhanced energy efficiency.¹² Analyses, for example by the International Energy Agency, reveal that failing to meet this challenge will most likely result in a rise in global temperature of at least 5°C by the end of this century. This increase would significantly exceed the two-degree limit which the EU considers crucial for avoiding dangerous climate change. Only if investment flows will be more effectively diverted towards the development of sustainable energy supply sources in the near future, a long-term lock-in effect to carbon intense technologies can be prevented. Furthermore, the enormous sum of private capital that is required will only be accessible for mitigation investments if the surrounding political, economic and social conditions are perceived favourable by private investors. In cases where public funds can be used effectively to eliminate these investment barriers on multiple levels and thereby significantly enhance inflows of private capital, the leveraging effect can be seen as an indirect financing option. On the national policy level,

⁸ IPCC, 2007a; Stern, 2006.

⁹ UNFCCC, 2008a.

¹⁰ G77 and China, 2008.

¹¹ Haites, 2008; Zhang and Maruyama, 2001.

¹² Cosby et al., 2008; IEA, 2008.

concrete measures to be taken in this context include, for example, the elimination of inefficient energy subsidies or the abolition of international trade restrictions.¹³

Market failures always justify further public policy interventions or the extended use of public monies. This phenomenon occurs typically in the context of investment in research and development of climate-friendly energy technologies due to its public good characteristics of public goods. The existence of external effects here triggers strategic behaviour of market actors, which then results in an inefficiently low investment level. Severe market failures exist in almost all phases of the innovation cycle and also hinder investment in energy efficiency where a lack of information and very long amortisation periods impede socially efficient market outcomes. In the absence of direct pay-off incentives for private actors market-based instruments may fail to generate sufficient levels of funding for climate protection and must therefore be complemented by public resources. Following this argumentation, Stern (2006) concluded that the carbon market only represents a partial solution to the funding problem.¹⁴

The Clean Development Mechanism (CDM) as one of the financial mechanisms under the Kyoto Protocol triggers the cooperation between actors in industrialised and developing countries in combating climate change. The mechanism thereby also serves as a means to mobilise private investment. However, due to its many existing weaknesses a discussion has emerged about different ideas for reform and improvement.

A fundamental problem of the CDM is that potential demand for certificates does not match potential supply. Based on the anticipated reduction targets for industrialised countries the UN climate secretary estimated the demand for certificates to lie in the range of only 0.5 to 1.7 Gt of CO₂-equivalents per year. In fact, the highest estimate for future demand was published by Point Carbon.¹⁵ This forecast assumes that all of the OECD countries and all European non-OECD countries as well as international aviation and maritime sectors will be assigned binding emission limits in the Copenhagen agreement. According to these calculations, the USA would account for 54 percent of the demand for certificates while another 20 percent would come from the EU.

Another assumption made in this estimation is that the mitigation potential in developing countries in 2020 amounts to around 7 Gt of CO₂-equivalents. This figure includes the reduction potentials inherent in the technologies currently recognised by the CDM, the potentials offered by REDD until 2020 as well as the potential offered by Carbon Capture and Storage technologies (CCS). Notably, the major share of the total mitigation potential can be achieved at a cost of less than USD 25 per ton.¹⁶ So clearly there is no match between supply and demand.

All these estimates were published before the global economic crisis had fully shown its impact. It has become clear by now that emissions will be far below the expected level of emissions at least in the near term, independent of climate policy measures to be implemented in reality. In the EU the prices for EU emission allowances have already halved in March 2009 compared to autumn 2008, as well as the price for CERs.

An additional point to consider is that the CDM in its current form is a pure offsetting-mechanism and does therefore not lead to any additional emission reductions in developing countries since the realised reductions are accounted for in the GHG balances

¹³ See e.g. UNEP, 2008; Cosbey et al., 2008 ; Doornbusch and Knight, 2008.

¹⁴ Assuming a stabilization scenario of 550 ppm Stern estimated the annual cost of climate protection in non-OECD countries in 2015 to equal 69 billion USD, out of which only 24 billion could be generated through carbon markets. In 2025, however, the carbon markets would be expected to generate the largest share of funding.

¹⁵ Point Carbon, 2008

¹⁶ UNFCCC, 2008a

of the industrialised countries. In order to comply with the 2°C limit, more ambitious reduction targets in industrialised countries need to be complemented by significant cuts in emissions below the business-as-usual scenario particularly in the rapidly industrialising countries. Hence, there is no doubt that the CDM in its current form is not designed in a way to meet this challenge. Another related issue is that a considerable number of CDM projects implemented to date do not meet the additionality criteria, which implies that their positive recognition in the mitigation performance of industrialised countries actually leads to increased overall emissions.¹⁷

Moreover, the developing countries increasingly express their discontent with the fact that industrialised countries harvest all the “low hanging fruits” in these countries but at the same time expect them to commit to more ambitious domestic reduction efforts. This conflict of objectives in the EU policy (i.e. creating low-cost mitigation opportunities for European industry in developing countries on the one hand and demanding stronger efforts from their side on the other hand, which leads to competition for low cost reductions) needs to be resolved.

All in all, there is no doubt that mitigation efforts and REDD will require large-scale additional financial flows that cannot be delivered by the CDM alone. The political need for establishing further funding mechanisms is therefore implied by the Bali Action Plan, which stipulates the enhanced climate protection efforts of developing and newly-industrialising countries are dependent on the industrialised countries’ provision of measurable, reportable, and verifiable support in terms of technology and finance.

1.2 Adaptation to climate change impacts

In the long run the scale of financial resources required for adaptation will be determined by global mitigation performance. The larger the achieved decline in emissions, the lower will be the cost of adaptation. In turn, costs are expected to increase significantly with every rise in global mean temperature.¹⁸ In the medium term, however, i.e. over the next two decades, the impact of climate change and thus the costs of adapting to it will not be affected by current mitigation efforts. It is also important to recognise that even a temperature increase of 2°C as compared to pre-industrial levels will have significant consequences and may possibly lead to a long-term but irreversible sea-level rise of several meters.¹⁹ In fact, a rise of this scale would seriously threaten the physical existence of 43 small island states, which is the reason why the Alliance of Small Island States (AOSIS) - in Poznan for the first time - has officially called for limiting temperature rise to 1.5 degrees.²⁰ The 48 states in the group of Least Developed Countries (LDCs) seriously discuss to support this position as well. Likewise, the chair of the IPCC, Rajendra Pachauri in his plenary statement in Poznan, expressed concern about the possible insufficiency of the 2°C limit to avoid dangerous climate change. He suggested, it might be necessary to limit warming to 1,5 °C. Since funding needs for adaptation are mainly concentrated on the most affected countries that are in particular the LDCs and the Small Island Developing States, public resources must be seen as a key approach because incentives for the private investment in this area are relatively weak.²¹ In the medium term, enhanced involvement of the private sector could be promoted through a well-

¹⁷ Schneider, 2008

¹⁸ IPCC, 2007b

¹⁹ Vgl. Hansen et al., 2008

²⁰ AOSIS, 2008

²¹ UNFCCC, 2008a

designed multilateral insurance or risk sharing mechanism that triggers pro-active adaptation efforts as a means of risk management and generates premiums, for example, for reinsurance of micro or infrastructure insurances, and other instruments.²²

1.3 The state of the debate after Poznan

The discussion on future funding mechanisms at the COP/CMP in Poznan (Dec. 1 – Dec. 12, 2008) mainly took place in the context of the “Ad-hoc Working Group on Long-term Cooperative Action (AWG-LCA)” and the 2nd Review of the Kyoto Protocol under Article 9. Particularly the proposals submitted by Norway (auctioning of emission permits), Mexico (Multilateral Climate Change Fund) and Switzerland (international carbon tax for funding adaptation), and the G77 plus China (determination of contributions on the basis of GNP) were in the focus of the debate.

A frequently mentioned point of critique was that to date the industrialised countries, including the "frontrunner" EU, have not made a clear statement concerning future funding regimes, whereas a growing number of emerging economies and developing countries have presented relatively ambitious strategies for climate protection, notably, South Africa, China, Mexico, and Brazil. The G77 and China, speaking for the developing countries, presented its ideas regarding a future institutional framework for cooperation in technology and finance. In the course of the discussions about these strategies and proposals it became obvious that their transformation into national policies requires immediate international action, which means that the provision of additional resources must not be delayed until after the new climate treaty regulating the post-2012 period will enter into force in 2013. Both mitigation and adaptation activities cannot wait until 2013 - and financing is a necessary condition. Moreover, the relevant paragraph in the Bali Action Plan moreover clearly states that the complete, effective and sustainable implementation of the convention through long-term cooperation must be achieved “now, up to and beyond 2012” (BAP 1). For these reasons and for the purpose of creating an atmosphere of trust that may facilitate the ratification process following the negotiations in Copenhagen it is necessary that the Copenhagen agreement will include provisions that deliver additional resources already before 2013 so that further activities (technology, REDD, adaptation) can be supported quickly.

In Poznan the provision of short-term additional resources was indeed one of the most controversially discussed issues in the negotiations on the 2nd Review of the Kyoto Protocol under Article 9 and it had finally to be closed without agreement. The main dispute concerned the extension of the CDM levy on other flexible mechanisms under the Kyoto Protocol (Joint Implementation and Emission Trading, see 3.2.) already before 2013. Eventually, the industrialised countries refused to approve the extension and were moreover unwilling to give a clear signal in favour of the auctioning of emission permits (see 3.4). In fact, the lack of consent in these issues has raised major concerns in developing countries particularly in South Africa, one of the most constructive emerging economies in the negotiations.²³

²² IIASA, Germanwatch, 2008; MCII, 2008

²³ "We are in particular concerned about the trust deficit; the widening gap in trust between developed and developing countries; and generally, we are disappointed by the lack of leadership by some developed countries. This includes (i) the inability of some developed countries to come forward with credible and ambitious mid-term targets; (ii) the deafening silence from developed countries in response to detailed G77&China proposals on technology and finance; and (iii) adaptation funding taking a back seat. (...) I am quite certain that binding support to developing countries could trigger matching mitigation commitments to act." Van Schalkwyk, 2009

The COP decided in Poznan that a first draft of Copenhagen's negotiation text shall be available by June 2009 at the meeting of the AWG-LCA in Bonn. The draft may then serve as a basis for the further deliberations. It is of major importance that the EU and other industrialised countries define a clear position in the debate on future financing options as soon as possible. This is the prerequisite for using the close interrelation between the climate protection efforts made in developing countries and the level of support provided by industrialised countries to create and sustain a positive momentum for the upcoming negotiations. In this regard, the EU has failed to move forward significantly in their recent conclusions on Copenhagen adopted by the Heads of States summit that was held on 19/20 March in Brussels.²⁴ It is progress that the EU indicates to negotiate about different options for generation of adequate financing. But the signal regarding the willingness to finance adequately ("fair share") is not clear enough to send a positive signal to the negotiations. This has to be seen as a strategic mistake and a missed opportunity to create additional dynamics for the upcoming negotiating sessions.

2 Overview of potential funding sources

Since the Bali Action Plan was agreed on in 2007 the political and scientific debate on options for a new financial architecture serving for climate change measures has become more substantial and realistic. In addition to the concrete proposals submitted by the Parties under the UNFCCC process the debate on financing models is also enriched by contributions from scholars and the business world.

2.1 *The analysed instruments and evaluation criteria at a glance*

Based on available studies the following options will be analysed in greater detail:

1. Resources from general national budgets²⁵
2. Extension of the levy on flexible instruments ("share of proceeds" from CDM, JI and possibly from the trade in AAUs)
3. Auctioning of emission allowances (national or regional)
4. Sale (auctioning/fixed price) of a portion of national emission allowances (AAUs)
5. Introduction of an aviation or maritime levy or the inclusion of these sectors into the emissions trading system
6. Introduction of a global carbon tax, i.e. a general tax on all climate relevant activities
7. Introduction of a "tobin tax", i.e. a general tax on international currency transactions

These options will be discussed regarding their compliance with the following list of criteria that was derived from the UNFCCC, the Bali Action Plan and other politically relevant considerations:

- a) *Expected revenues:* A new or advanced financial architecture must generate the amount of resources necessary for stabilising the GHG concentrations below the level that is sufficient to prevent dangerous climate change. It should be noted that these estimates are indicative at best because most of the underlying assumptions have uncertainties and are manipulable in both directions, upwards and downwards, through political negotiations. Without a quick recovery the actual

²⁴ See EU, 2009

economic crisis has the potential to limit all expectations regarding income from the carbon market (auctioning).

- b) *Predictability*: Resource availability must be reliable. This is important for building trust among different countries and for safeguarding the viability of the whole financial architecture, also regarding its catalytic effect on private investments.
- c) *Climate impact and compliance with the polluter-pays principle: mitigation impact and reflection of the polluter-pays principle*: The polluter pay principle should be reflected in order to enhance further mitigation activities. The analysis examines to what extent the instrument directly provides additional incentives for reducing emissions by internalizing its social costs into the polluters' calculations. A related aspect is the extent to which the instrument enables the differentiation between countries (industrialised versus developing countries and/or within these groups) according to their responsibilities.
- d) *Effects on competition*: A negative impact on competition should be avoided. Thus, it is investigated to what extent the instrument may affect international competition among states and private actors.²⁶
- e) *Interference with national sovereignty and political feasibility*: Interference with national sovereignty decreases political feasibility. Thus, the analysis provides an estimate on the extent to which the instrument interferes with national sovereignty and the anticipated level of political resistance. It is important to recognize that these aspects may differ from country to country and therefore must also be considered from a constitutional perspective.
- f) *Additionality*: The Bali Action Plan as well as the UNFCCC constitute the additionality of funds as a key criterion, which prevents a simple "renaming" and diversion of existing development assistance flows. However, there is disagreement on its interpretation, regarding the question whether additionality is defined in relation to actual ODA payments or in relation to the existing commitment of industrialised countries to make 0.7 percent of GNI available for ODA purposes. The latter interpretation could imply that out of the resource pool that is generally available for ODA only those contributions count as additional which exceed the anticipated baseline of ODA payments until 2015. This date is the agreed (Millennium Development Targets) deadline for industrialised countries as their deadline for achieving the 0.7 percent target. Furthermore, additional resources could also in this case come from sources that generally not allow counting against ODA commitments. Another related approach that might be discussed is to increase the 0.7% target, in accordance with the additional resources to be generated for climate policy objectives, which, however, should be accompanied by a stronger compliance mechanism.

A further criterion that is relevant in the negotiation context is the time frame for implementation of the suggested models. More precisely, this relates to the question whether an instrument requires the ratification of a new climate treaty (or of an extended

²⁵ This approach is also often referred to as "assessed contributions"

²⁶ In general, it can be concluded that the effect on competition is minimised when all countries are equally involved. However, the UNFCCC as the basis for negotiations explicitly differentiates between so-called Annex-I (industrialised) and non-Annex-I (developing countries) and thereby constitutes a certain degree of inequality. Interestingly, some proposals (Mexico, Schweiz) comprise ideas on how to overcome the Annex based structure of the Kyoto Protocol. The course of the discussions on this issue is not yet foreseeable. Principally, the sale/auctioning of AAUs can also be combined with sectoral agreements in emerging economies.

Kyoto Protocol) to come into effect or whether it could be implemented earlier already as part of a Copenhagen agreement in order to enable near-term financing. Currently, available legal expert judgement about this issue is insufficient, and some parties have contradicting viewpoints, for example, regarding option 4. That is why further legal analysis of this aspect is necessary, but can not be dealt with in this briefing paper.

2.2 Definition and differentiation of liabilities to contribution

In the UNFCCC discussions different methods for determining obligations for contribution are discussed (for example, those suggested by Norway, Mexico, Switzerland, the AOSIS, G77 plus China or by academics). Interestingly, some of these proposals overcome the Convention's strict distinction between Annex-I (industrialised) and non Annex-I (developing) countries and thereby promote the inclusion of emerging economies and developing countries according their national capabilities and responsibilities. This approach also adheres to the fact that one of several basic foundations of the Convention – that the “largest share of current global emissions of greenhouse gases” originates in developed countries - is no longer true. The fact does question neither the historical responsibility nor much higher per capita emissions of the developed countries, but shows that the world is changing.²⁷

From a strategic viewpoint it may be more conducive to future negotiations to speak of “nationally appropriate actions” and not to use the emotionally loaded and ambiguous term “differentiation”. Most of the approaches to defining obligations aim at operationalising the UNFCCC's fundamental principle of “common but differentiated responsibilities and respective capabilities” (Article 3.1) by referring to specific indicators such as GDP per capita or (current or historical) CO₂ emissions per capita (current or cumulative, for example, 1992-2004).²⁸

Table 2 shows the results of one of the most elaborated models, the “Greenhouse Development Rights Framework”, that determines percentage-based liability obligations on the basis of capacity (measured through per capita income) and responsibility (measured through cumulative per capita emissions since 1990). The EU's liability, accounting for 25.7 percent of total funding in 2010, is expected to diminish over time due to the overall increase in emissions from developing countries, particularly in China.

²⁷ UNFCCC, 1992: 2

²⁸ See Baer et al., 2008; Mexico, 2008; AOSIS, 2008; Switzerland, 2008

Table 2: Responsibility and Capacity Index (RCI) for selected countries and country groups according to the “Greenhouse Development Rights Framework”. Source: Baer et al., 2008: 18

GDRs results for representative countries and groups							
	2010					2020	2030
	Population (percent of global)	GDP per capita (\$ US PPP)	Capacity (percent of global)	Responsibility (percent of global)	RCI (percent of global)	RCI (percent of global)	RCI (percent of global)
EU 27	7.3	30,472	28.8	22.6	25.7	22.9	19.6
EU 15	5.8	33,754	26.1	19.8	22.9	19.9	16.7
EU +12	1.5	17,708	2.7	2.8	2.7	3.0	3.0
United States	4.5	45,640	29.7	36.4	33.1	29.1	25.5
Japan	1.9	33,422	8.3	7.3	7.8	6.6	5.5
Russia	2.0	15,031	2.7	4.9	3.8	4.3	4.6
China	19.7	5,899	5.8	5.2	5.5	10.4	15.2
India	17.2	2,818	0.7	0.3	0.5	1.2	2.3
Brazil	2.9	9,442	2.3	1.1	1.7	1.7	1.7
South Africa	0.7	10,117	0.6	1.3	1.0	1.1	1.2
Mexico	1.6	12,408	1.8	1.4	1.6	1.5	1.5
LDCs	11.7	1,274	0.1	0.04	0.1	0.1	0.1
Annex I	18.7	30,924	75.8	78.0	77	69	61
Non-Annex I	81.3	5,096	24.2	22.0	23	31	39
High-income	15.5	36,488	76.9	77.9	77	69	61
Middle-income	63.3	6,226	22.9	21.9	22	30	38
Low-income	21.2	1,599	0.2	0.2	0.2	0.3	0.5
World	100	9,929	100%	100%	100%	100%	100%

2.3 National obligations in the context of international instruments

Considering past experiences with (mostly non-binding) international obligation there is good reason to question the predictability and reliability of contributions paid out of national budgets. The so-called “domestic revenue” problem may impose a major barrier to predictability and reliability as it constitutes that it is difficult to achieve sustained political agreement on the use of national tax revenues for the provision of global public goods. According to this logic, domestically raised resources should remain subject to national authority.²⁹ The willingness among citizens, government and parliament to provide domestic public revenues for international purposes will diminish the larger the scale of the required resources. A good example of this phenomenon is the voluntary commitment of industrialised countries to spend 0.7 percent of their GNI on ODA. Since this decision was made in 1970 only very few countries have achieved this target (at the moment five countries). On average, the share of GNI dedicated to ODA equals only 0.28 percent and more than USD 100 billion annually would be required to close this gap.³⁰ The reaction by some countries to significantly cut down ODA, for example Ireland and Italy, due to the current economic crisis, underlines again the lack of reliability of such voluntary commitments.

In addition to actually generating the necessary resources for mitigation and adaptation, it is therefore important that the negotiations leading to a new climate treaty also help to

²⁹ Müller, 2008a; Doornbusch and Knight, 2008

³⁰ Harmeling, 2008

restore the trust among countries that was destroyed in the ODA debate. Here, at least three approaches need to be considered:

- 1) Obligations binding under international law should be complemented by an appropriate sanction mechanism to ensure compliance and/or
- 2) Funding instruments should be complemented so that maximizes conformity with the polluter-pays principle and guarantees a sufficiently high level of performance of the obligations (particularly options 1, 3, and 4 could serve this function).
- 3) Innovative financing mechanisms should be designed in a manner to generate resources independent of national budgets.

Combining options 1 and 2 is possible and could be complemented with option 3.

The following example illustrates the possible interplay of these three options: It is assumed that parties of the UNFCCC agree on anticipating the financial needs in developing countries to amount to say EUR 150 billion a year. Principally, these costs should be allocated to individual states on the basis of certain criteria for differentiation. Thereby, the relative obligations are determined (option 1). In case additional, innovative financing instruments are implemented (option 3, for example a levy on international aviation), that generate, for example, EUR 50 billion, only the remaining EUR 100 billion would need to be covered by national contributions and the same allocation key could be applied. Instruments such as the auctioning of AAUs or a GHG levy could then be used to make responsible polluters incur these remaining costs.

This kind of hybrid financing model thus works in three steps: First, national liabilities are determined, then it is investigated to what extent these could be covered through international instruments and at last, complementary instruments on the domestic level are chosen to fund the remaining share.³¹ The advantage of such a hybrid approach is that it helps to alleviate the domestic revenue problem mentioned earlier without compromising the necessary increase in available resources. Doornbusch and Knight (2008) and Müller (2008b) therefore consider a hybrid financial architecture to be a practical solution as it combines the benefits of different alternatives. However, the performance of the individual instruments regarding the evaluation criteria is likely to change when implemented in combination. **In general, it may therefore be most promising to focus the discussion on one instrument or a small and logically closely related group of instruments, instead of considering a wide range of options.**

Furthermore, two additional aspects are worthwhile noticing:

1. So far the political debate about some of the instruments has been mainly focussed on their suitability to finance specific purposes. For example, option 2 – extending the share of proceeds (see 3.2) - is typically considered as a means to enhance the Adaptation Fund under the Kyoto Protocol. Nevertheless, option 4 that had been suggested by Norway to finance adaptation in the first place is now frequently discussed in the context of funding for avoided deforestation or technology cooperation. In general, it is preferable to analyse the different instruments independent of the intended use of the generated resources because the goal is to develop an overall financial architecture that enables funding for a variety of purposes.
2. A criteria-based approach may also be useful to determine the contribution of each individual instrument to the overall pool of resources. For example, such a calculation could help to determine the shares of AAUs to be purchased by different countries (see 3.4). Instead of simply assuming the same share for all

³¹ Müller, 2008a

countries based on the agreed-on reduction targets, this more differentiated approach would actually allow for taking specific aspects such as past emission developments and historical responsibilities into account. Although this method would alter the instrument's impact on competition, these effects are politically justifiable in order to implement the principle of common but differentiated responsibilities and respective capabilities.

3 Analysis of the individual instruments

In this section the suggested instruments will be analysed individually with reference to the outlined evaluation criteria. Table 1 on page 5 summarizes the key conclusions of chapter 3.

3.1 Resources from general national budgets

Relevance in the international discussion: With reference to the UNFCCC's fundamental constitution, particularly the G77 and China demand for enhanced contributions to be made out of the national budgets of industrialised countries. In total, payments in the range of 0.5 to 1 percent of GNI (approximately USD 201 to 401 billion, 2007) are claimed with the largest part coming from national budgets.³² In the context of a criteria-based determination of national liabilities for all countries (see 2.2 and 2.3) domestic budgets may play an important role but they could moreover be combined with other instruments including the sale of permits under national or regional ETSs (3), the international sale of parts of the AAUs (4) or the sale of AAUs on the country level.

- a) *expected revenues:* In theory, revenues can amount to the level of financing deemed necessary by the G77 and China (hundreds of billions per year). However, the level of contributions would ultimately depend on political decisions made by national governments and international negotiators.
- b) *Predictability:* The experiences made with ODA demonstrate that the reliability of voluntary funding commitments is limited, for example, by domestic revenue problems. A high level of predictability is only given in case
 - the obligation is appropriately fixed under international law;
 - the criteria for determining the individual liabilities are well defined;
 - there exists an adequate sanctioning mechanism to address non-compliance.

However, the probability for an effective sanctioning mechanism to be incorporated in the post-2012 framework is low. Among other reasons, constitutional concerns in some countries (for example in Japan) might trigger resistance. All in all, the predictability of this financing option is limited.

- c) *Climate impact and compliance with the polluter-pays principle:* On a national level the approach simply leads to a collectivisation of environmental costs without directly incentivising further mitigation efforts. However, the polluter-pays principle could be internalised in two ways:
 - *On the international level:* By choosing appropriate criteria for determining national liabilities the countries' payment obligations can at least partly be subjected to the polluter-pays principle (see, for example, the Swiss proposal and to a certain degree the Mexican proposal), which moreover enables an objective differentiation within the groups of industrialised and developing countries respectively.

³² G77 and China, 2008

- *On the national level:* Governments may implement domestic measures to ensure that polluters ultimately pay for the international contributions, for example, an ETS with auctioned allowances, or emission taxes, and thereby directly trigger emission reductions.
- d) *Effects on competition:* Assuming that all of the relevant countries are participating, the direct impact can be considered neutral because national governments are principally free in their decision about how to fund their contribution domestically. However, a significant divergence of national approaches for resource generation may affect competition between specific sectors.
- e) *Interference with national sovereignty and political feasibility:*
 - The extent to which national sovereignty is compromised correlates with the level of resource contributions that governments commit to under international law.
 - This commitment already means a significant interference, particularly if it is based on the legally binding acceptance of the internationally agreed on criteria for determining national liabilities, because in this case the calculation of the payment obligations becomes an automatic process. The impact becomes even stronger if a sanctioning mechanism is to be established.
 - In any case national governments retain their authority regarding domestic funding sources.
 - Particularly in the current economic crisis it is reasonable to assume that the higher the targeted level of resource generation, the higher will be the anticipated political resistance of finance ministers towards this financing instrument.
 - It is questionable that agreement on the implementation a meaningful sanctioning regime could be reached.

Nevertheless, the implementation of this option, at least as a partial solution, is generally expected to encounter less political opposition than the option of international emission taxes (3.6) or the levy on international currency transactions (3.7). Hence, a realistic approach might be to use national liabilities as the basis of a hybrid solution and complement it with national/regional auctions of tradable emission permits (3.3) or the sale of AAUs (3.4).

- f) *Additionality:* This option does not actually open up new resources. It appears realistic to expect that the national contributions will be allowable against the general ODA commitment if no clear rules can be established that payments to count as ODA must at least exceed an adequate baseline. In some cases, one may even observe a reallocation of existing ODA payments.

3.2 Extended “share of proceeds” for CDM, JI and international emissions trading

Relevance in the international discussion: The levy “share of proceeds” on CDM transactions is constituted in the Kyoto Protocol. Whenever emission reduction certificates are issued to CDM projects 2 percent are taken and given to the Protocol’s Adaptation Fund. Recently, the extension of this mechanism to also include Joint implementation projects and international trade in AAUs has been discussed. In Poznan, the G77 and China have pushed for an extension of the “share of proceeds”, both as a means for short-term financing (prior to 2012) and as integral part of the second commitment period of the Kyoto Protocol after 2012. However, it must be kept in mind that at least for the time after 2012, a major objective of any financing model should be to ensure involvement of the USA in funding international climate change policy. Anyway, reaching agreement in Copenhagen on the extension of the “share of proceeds” to JI

could be important for future dynamics of negotiations since it would finally put an end to the anticompetitive, unequal treatment of CDM and JI.

- a) *Expected revenues:* The level of resource generation achievable through the extension of the “share of proceeds” is dependent on the levy rate and future market developments, which in turn largely depends on future mitigation targets in industrialised countries and the hereby implied demand for emission reduction certificates:
 - The existing 2 percent levy on CDM projects is estimated to generate revenues of about USD 80 to 600 million over the time period between 2008 and 2012.³³ The revenue inflow after 2012 is dependent on the further advancement of the CDM.³⁴
 - The extension of the levy to Joint Implementation and international Emissions Trading between countries after 2012 could potentially lead to additional revenues in the range of USD 30 million to 2.2 billion per year.³⁵
 - In principle, raising the levy rate is also an option (for example, to 3 to 5 percent as suggested by Pakistan).³⁶
- b) *Predictability:* The levy is due “automatically” with every first transfer; however, the overall amount is dependent on the total volume of CDM-/JI-projects and/or the volume of trade in AAUs as well as on future market price developments. For example, the price for CERs has halved by March 2009 compared to September 2008, as a consequence of the economic crisis. The future of CDM-/JI-markets is significantly affected by the mitigation targets for industrialised countries. The earmarking of the revenues for climate-related purposes is very likely to be sustained even in case the “share of proceeds” is significantly extended.
- c) *Climate impact and compliance with the polluter-pays principle:* Incentives for enhancing mitigation are provided by creating a market for CO₂ in the first place, which means that the additional effect of the transaction levy can be expected to be neutral. To a certain degree, the levy on flexible instruments could restrict the economically rational realisation of low cost mitigation opportunities. The UNFCCC however, does not directly define pure cost efficiency as its overriding goal, the framework rather links this aspect with more fundamental equity considerations. The polluter-pays principle would be respected in the sense that certificates purchases are made to off-set emissions, but do not have an additional effect.
- d) *Effects on competition:*
 - The effects are neutral assuming identical levy rates worldwide. However, exemptions already exist: It was decided in Bali that CDM projects in LDCs should be freed from the 2 percent levy.
 - In theory, the levy represents an additional cost factor that may restrict the economic viability of realising low cost reduction potentials. However, compared to other existing barriers to the implementation of CDM projects such as complex administrative procedures or high transaction costs these effects can be considered minor.

³³ UNFCCC, 2008a

³⁴ The implementation of, for example, sectoral agreements has the potential to generate a significantly higher number of certificates and thus significantly enhance expected revenues.

³⁵ See, for example, UNFCCC, 2008b: 41; until 2012: currently 3 Gt in the pipeline, 2 percent thereof equal 60 Mt, multiplied with a price of EUR 10 result in revenues of EUR 600 million; the FCCC secretary estimates USD 80-300 million p.a. with 300-450 mio. CERs issued p.a. at a price of USD 23.60.

³⁶ An argument opposing the extension of the share of proceeds on project-based mechanisms, which is brought forward also by the EU, is that this would compromise the profitability of the projects and thereby make mitigation more costly. But it remains questionable whether the economic viability of projects would seriously be affected, accounting for the fact that many projects to date cannot be considered additional in the narrow sense and would have been worthwhile undertaking even without CDM revenues (see 1.1.)

- At present, the CDM is disadvantaged as compared to the other flexible mechanisms, i.e. JI and international Emissions Trading, since the latter two are not affected by such a levy.
- It is not yet decided whether and in what way the USA as a non-Kyoto party will make use of these instruments in the future. Currently they are excluded from the financing mechanism.
- e) *Interference with national sovereignty and political feasibility:*
 - With regards to CDM and JI national sovereignty is (at most) only indirectly affected since the levy is imposed on private market transactions;
 - the government's discretionary power to get involved in both mechanisms is generally not compromised;
 - a more significant interference is given in case the levy was imposed on international emissions trading, i.e. on the transfer of allowances from one Annex-I country to another.

The political opposition to the implementation of an extended and/or enhanced levy on JI/CDM can generally be expected to be rather limited in the context of a Copenhagen deal compared to other approaches, because of the limited scope of this instrument. In the authors' view this holds true even if no agreement could be reached in Poznan on that issue, which had timing, strategic as well as legal reasons. However, it would probably require an amendment to the Kyoto Protocol, which may become a serious obstacle but could be integrated in the post-2012 agreement. Extending the "share of proceeds" to also cover trade with AAUs is legally feasible but little realistic from a political perspective.

- f) *Additionality:* This financing option is in fact able to generate truly additional resources because instead of relying on direct government payments it is based on contributions in the form of emissions reductions units that would then still require liquidation. This circumstance can be expected to prevent the declaration of these contributions as part of ODA.

3.3 Sale of emission certificates in national or regional emission trading schemes (ETS)

Relevance in the international discussion: The EU and Germany have already presented this option as an innovative financing mechanism. It is moreover considered by the authors to be a potential measure for funding compliance with national liabilities (see chapter 2.2). Notably, this option is only relevant to countries that have already implemented emissions trading schemes or plan their implementation in the future (i.e. primarily industrialised countries). In fact, not even all of the Annex-I countries can be expected to meet this condition prior to the start of negotiations in Copenhagen. In addition it is possible that a Copenhagen agreement will include the implementation of emission trading schemes for internationally relevant sectors that also involve these sectors in non-Annex I countries (see also 3.5).

- a) *Expected revenues:* The level of generated resources is mainly dependent on the market price for certificates and the share of allowances that is dedicated for sale by auction:
 - According to first estimates of the European Commission for the EU trading scheme revenues of about EUR 50 billion could be generated until 2020 assuming an auctioning rate of 100 percent at a price of EUR 30 per ton. However, following the

recent decisions about the EU climate and energy package these figures require significant downward adjustment.³⁷

- In case all industrialised countries, particularly the USA implemented emissions trading schemes, total revenues would potentially multiply.
- Relevant to the international negotiations is only the share of revenues that is actually dedicated to international climate policy measures and is not earmarked for domestic investment purposes. The EU yet has not agreed on a fix percentage of the revenues to earmark for international purposes.

b) *Predictability:*

- The absolute level of resource generation is dependent on the market price of certificates and the share of allowances that is not allocated for free.

Regarding the transfer of resources on the international level it is crucial

- whether this instrument is combined with the determination of national contribution obligations;
- to what extent these obligations are binding;
- and to what extent the earmarking of the auctioning revenues for international purposes is actually enforceable.

The combination of this option with funds coming from national budgets (3.1) or the sale/auctioning of AAUs appears to be a realistic solution. The sale/auctioning could also be used as a non-compliance mechanism for countries which don't fulfil their financing obligation based on auctioning in the national emission trading system. At this point in time it is not yet foreseeable which industrialised countries (and possibly which specific sectors in emerging economies) would enter into cap-and-trade schemes. The new US administration is seriously discussing a nation-wide Emission Trading Scheme (ETS) with a significant share of auctioning and has announced to try to move this forward as much as possible until Copenhagen. In face of the severe economic crisis, more recent statements by President Obama suggest that most of the resources might be used domestically for various purposes, but there are other voices as well..

- c) *Climate impact and compliance with the polluter-pays principle:* In contrast to grandfathering systems the early price signal provided by this instrument incentivises additional mitigation efforts and enhances the trading scheme's efficiency and its steering effects. It should be noted, however, that the hereby defined price for CO₂ only reflects abatement costs and not necessarily means the full internalisation of all external effects. Conformity with the polluter-pays principle is only given if all relevant polluters are actually included in the trading scheme or another scheme like a levy or tax.

d) *Effects on competition:*

- The sale of allowances has generally less adverse effects on competition than their free allocation since windfall profits are prevented through the internalisation of opportunity costs. The impact is generally dependent on the design of regional/national ETS.
- The impact is neutral within the sectors that are included in the trading scheme, except if approaches are applied that differentiate for example to lower the burden for heavy-polluting companies, which is often politically desired.

³⁷ This is due to the initial exclusion of most of the industrial sector from the auctions, the exemptions agreed on for the energy sector and the permission of high shares of price deflating CERs. However, assuming a successful outcome in Copenhagen it will be necessary to modify the present regulations.

- For sectors that compete internationally, the relocation of emission intense industries to countries that do not participate in the trading scheme and lack comparable regulation may lead to “carbon leakage”. That is why additional sectoral systems are discussed in the UNFCCC and in contributing processes like the Major Economies Meetings, that could possibly even enable the inclusion of emerging economies into the trading scheme.
 - In order to minimize impacts on competition within the transportation sector as well as between the transportation sector and other sectors such as telecommunications, it would be preferable to include international aviation and maritime transport into the trading system.
- e) *Interference with national sovereignty and political feasibility:* The implementation of an emissions trading scheme which comprises the sale of certificates and the earmarking of revenues significantly interferes with national sovereignty.
- Nevertheless, political agreement in favour of this instrument may still be easier to achieve than for those instruments suggesting to sell off a share of AAUs (options 3.4), to introduce an international emission tax (option 3.6) or to impose a levy on international currency transactions (option 3.7) because the discretionary power retained in the hands of government is still greater. By including aviation into the trading scheme and auctioning off a share of the certificates with earmarked revenues the EU has already taken a first step towards integration of options 3.3 and 3.5.
- f) *Additionality:* In the absence of clear and enforceable rules that at least define an adequate baseline (see 2.1.) it is likely that the contributions made under this approach will be deducted from ODA obligations. However, the earmarking of the generated resources for climate-related purposes is rationally justifiable and its implementation can therefore be realistically assumed.

3.4 Sale / Auctioning of AAUs

In the first commitment period of the Kyoto Protocol (2008-2012) the Annex-I countries receive their share of “Assigned Amount Units” for free. Selling (via auctioning or via a fixed price model) a share or all of the AAUs is now one of the key options being discussed to generate additional financial resources. It is often referred to as the Norwegian proposal.

According to this proposal, a certain portion of allowances is deducted from a country’s quota prior to their allocation and then either auctioned off through some kind of international institution or sold for a fixed price. In principle, this approach is similar to option 3.2, but happens on a different level.

It would also be possible to design AAU auctioning in a way that Annex-I countries receive 100 percent of their allocated emission allowances first, but are obliged under international law to sell off a certain share of their quota (domestic sale). In this case, decisions on method and timing of the liquidation remain in the discretion of national governments. Potential buyers include either the respective government or actors in those sectors that have to realise a share of the overall national obligation.

All in all, both options are quite similar, which is why there are presented together. The main difference is that the second option warrants the national governments a higher degree of discretionary power because they can choose between an auction and an outright sale and which institution should be in charge of administering the transaction.

This degree of freedom, however, may overall compromise the consistency of the system across industrialised countries. And in fact only the international approach is now seriously being discussed in the UNFCCC negotiations.

Relevance in the international discussion: Norway has proposed the international sale (more specific: the auctioning) of AAUs in Bali for the first time and has been continuously promoting the model since then. In Poznan, the EU has shown more openness towards a consideration of AAU auctioning. Only recently, Heads of States of the EU had concluded that “market-based approaches based on auctioning arrangements” are one of two options specifically mentioned (the other one is the contributory approach based on an agreed scale).³⁸ In Poznan, Switzerland mentioned the possibility to combine the Norwegian proposal with their own concept and in fact, Norway and Mexico deliberate on the feasibility of combining both approaches. Among NGOs (CAN International) and some scholars the international auctioning of allowances is seen as one of the most promising options because it has the potential to generate resources of the required scale and moreover it is well compatible with the logic of the existing climate policy architecture.³⁹

In this context it is crucial whether such a solution would be integrated into the second commitment period of the Kyoto Protocol or whether it would be implemented under the convention (or through some kind of linking provisions). In the first case the adequate participation of the USA in the international financing effort must be ensured in order to avoid compromising the instrument’s effectiveness (i.e. the high level of generated resources), its neutrality in terms of effects on competition and its fairness. Up to now the G77 and China have focused the international discussions about this option in the Kyoto negotiations track and a position in the AWG-LCA negotiations has not been defined yet. One way to signal general openness towards debating the two options without risking a premature commitment to one or the other may be to ask the UNFCCC to produce a Technical Paper about their design and implementation.. In doing so, the feasibility of combining AAU sales with criteria based approaches (as for example suggested in the proposals by Mexico and Switzerland) should be assessed.

- a) *Expected revenues:* Depending on what share of AAUs is dedicated for sale, the expected revenues could amount to tens or hundreds of billions: USD 15 to 25 billion assuming a portion of 2 percent⁴⁰, and up to 52 billion assuming a portion of 7.5 percent^{41, 42}.
- b) *Predictability:* With an appropriate climate treaty entering into force, the occurrence and level of funding can be considered secure:
 - the participation of countries in the initial allocation process is very likely;
 - An outright sale at a fixed price as compared to an auction may possibly reduce future revenue streams but makes them more predictable at the same time.
 - However, the level of resource generation is dependent on future market developments.
 - In the most extreme case revenues could fall short of expectations due to a sufficiently large drop in emissions that can be either politically induced or caused

³⁸ EU, 2009a: 11

³⁹ See Müller, 2008a; CAN International, 2008

⁴⁰ UNFCCC, 2008

⁴¹ Oxfam, 2008

⁴² The calculation is generally easy, given baseyear emission levels, the assumed reduction target, the assumed portion of AAUs for sale and an assumed market price: baseyear emissions = approx. 21.6 Gt (incl. USA), reduction of 25 percent until 2020 => approx. 16 billion AAUs, thereof 7.5 percent for sale => approx. 1.2 billion AAUs.

by other effects and that effectively compensates the partial sale of AAUs. The current economic crisis is exactly the latter case. Moreover, parties could deliberately choose lower reduction targets in order to avoid the purchase of allowances. The risk of strategic behaviour can be minimised if countries had to purchase all of their AAUs.

- The option of international sales is favourable over the domestic sale in terms of predictability as it overcomes the domestic revenue problem.
 - Withholding an additional share of AAUs from national budgets is an option to raise additional revenues in case Parties do not comply with their funding obligations.
 - For a post-2012 commitment period a key question is the banking of AAUs not used in the first commitment period. If banking would be possible, than it might be the case that Annex I Parties would buy for example “Hot air” AAUs instead of purchasing AAUs from an international auctioning procedure. The resources would than go to the countries selling the “hot air” rather than contributing to international climate finance.
- c) *Climate impact and compliance with the polluter-pays principle:*
- By setting an early price signal this instrument incentivizes additional mitigation efforts;
 - Countries with higher emission levels typically have to spend more money on allowance purchases;
 - The instrument’s steering effect may be lost however, when countries push for less ambitious mitigation targets in order to partly or fully circumvent their purchase obligations. Selling off all of the AAUs effectively prevents this type of strategic behaviour.
 - At present, the instrument is only applicable to countries with assigned reduction targets (Annex-I countries). However, there is a general possibility for broadening its scope to include sectoral emissions trading schemes even in emerging economies that do not face national obligations at the moment.
 - The impact is the same for all countries in need of AAUs and it reflects a strict implementation of the current polluter-pays principle.
 - The historic responsibility which is not addressed explicitly may be addressed through differentiating the quota that Parties have to purchase, in the sense of what has been described in chapter 2.2.
- d) *Effects on competition:*
- The effects in terms of competition are neutral for countries with reduction targets and presuming that the portion of AAUs to be sold is identical across countries;⁴³
 - at present, the instrument is therefore only applicable to Annex-I countries, while leaving developing countries that are currently exempted from binding targets uninvolved;
 - If internationally competing sectors in Annex-I countries face higher cost due to their inclusion in the emissions trading scheme while the same sectors in non-Annex-I countries are free from this constrain, competition may be distorted. This issue can be resolved by establishing appropriate sectoral agreements with developing countries.
- e) *Interference with national sovereignty and political feasibility:*
- At first glance, the interference with national sovereignty appears to be larger than for other options.

⁴³ The impact of the instrument on individual countries with or without implemented emissions trading systems requires further investigation. The authors are not aware of any studies elaborating on this question.

- Since emission allowances were allocated for free in the first commitment period, the introduction of a future sale-off of allowances would principally just reflect the “scaling-up” of the existing EU ETS system.
 - Countries can effectively circumvent their purchase obligations by achieving larger emission reductions.
 - The political feasibility of this instrument on a national level is likely to be dependent on the ultimate source of funding. The money spent on the purchase of AAUs could either come from the general budget (3.1), the auctioning of permits in national/regional ETSs (3.3) or from other revenue generating measures. Also, an exception could be established for those countries that have implemented national/regional ETSs and have bindingly earmarked a sufficiently large portion of the revenues for international climate purposes.⁴⁴
- f) *Additionality*: To avoid the ‘domestic revenue problem’, the AAUs could be pooled in a holding account at the International Transaction Log (ITL), before they are issued to the country registries, and then be auctioned. In that case, it is at least not plausible that resources spent on the international purchase of AAUs could be deducted from national ODA obligations or that this treatment would find the necessary support in the negotiations, since the primary objective is to purchase an international good, and not a solidarity action.⁴⁵ Hence, there is good reason to assume that the funds raised through international sales of AAUs are truly additional. Regarding sales on the country level, additionality is primarily dependent on the extent to which the financial contributions are allowable towards the ODA quota. In fact, assuming the percentage share of allowances for sale to come close to 10 percent, the instrument is able to generate sufficient revenues to close the gap with the 0.7 percent target in some countries. This point is likely to raise severe concerns among developing countries.

3.5 The imposition of aviation and maritime levies or the inclusion of these sectors into the emissions trading system

Relevance in the international discussion: The individual options are mentioned in different contexts:

- the 48 LDCs explicitly demand the introduction of a ticket charge to finance adaptation measures (International Air Passenger Adaptation Levy, IAPAL);⁴⁶
- India recognises a levy charged on international aviation and maritime transport under the convention as a possible option.⁴⁷

These statements by developing countries should be seen and appreciated as an important and positive signal because they demonstrate a general willingness to contribute to the international funding efforts through this type of mechanisms. In fact, some important members of the G77 and China still strictly oppose the inclusion of both air and maritime transport into the emissions trading system. On the other side, Tuvalu (not a member of the G77 and China) recently expressed explicit support for including these sectors as a means to generate additional funding. It should be kept in mind, however, that the inclusion of international aviation into the ETS in the EU (already approved) and the USA would already be sufficient to capture around 80 percent of the climate impacts of

⁴⁴ AAUs are not allowable in the EU-ETS.

⁴⁵ Müller, 2008a

⁴⁶ LDCs, 2008

⁴⁷ India, 2008

international aviation. For maritime transport, inclusion in Annex-I targets would be much more difficult and does not seem to be a desired option.⁴⁸

Possibly, in case of a rapid introduction, levies may be used to raise funds for adaptation and other purposes already prior to 2013; or, if introduced by developing countries, as a measure that complements the revenue generation through auctioning in Annex I Parties (when aviation is included into their targets).

- a. *Expected revenues:* Kerosene tax: assuming a rate of Euro 0.05 per litre, approx. EUR 13-21 billion worldwide p.a.⁴⁹
 - b. Aviation levy.
 - i. assuming a rate of about 5 percent of the flight ticket price, approx. EUR 10-16 billion worldwide p.a.⁵⁰
 - ii. assuming a rate of USD 2 to 100, ranging from USD 0.2 to 24 billion p.a.⁵¹
 - c. Maritime levy (International Maritime Emission Reduction Scheme, IMERS): USD 4–15 billion p.a.⁵²
 - d. Inclusion of maritime transport into the ETS: USD 10-16.6 billion p.a.⁵³
 - e. Inclusion of aviation into the ETS: USD 12.4 billion p.a.⁵⁴
 - f. Tuvalu Burden Sharing Mechanism⁵⁵: aviation and maritime levy differentiated according to country groups (Annex-I, non Annex-I): USD 1.6 billion p.a.⁵⁶
- b) *Predictability:*
- Although the levy is due “automatically” every time a certain service is purchased, the total volume of generated resources is dependent on the demand for the respective services. The levy rate or the market price for certificates (mainly specified by the stringency of the cap) determine the instrument’s ecological steering effect;
 - Regarding the inclusion into ETS the predictability is somewhat lower due to the relatively high volatility of the market price for CO₂, compared to for example the demand for flights;
 - Most of the currently available calculations assume that the impact of the discussed levies on the quantity of demand for the affected services is rather small.⁵⁷ Therefore a generally high level of predictability is given even though significant variations are always possible (for example, regarding the drop in demand for flights due to the economic crisis or the 09/11 terrorist attacks, or volatile auction prices for certificates).
- c) *Climate impact and compliance with the polluter-pays principle:*
- a. Kerosene tax/GHG levy: The internalisation of external costs and additional ecological steering effects are generally feasible if the levy rate is set sufficiently high (realisation of technological potentials and improved air traffic management).
 - b. Charge on flight tickets: The additional steering effect is likely to be small due to low price-elasticity and the missing link to caused emissions. If the charge varies regarding distance, the indirect effects would be similar to those described under a.

⁴⁸ See also WWF, 2008

⁴⁹ WBGU, 2002

⁵⁰ WBGU, 2002, Oxfam, 2008

⁵¹ Chambwera und Müller, 2008

⁵² UNFCCC, 2008a

⁵³ WBGU, 2002

⁵⁴ Oxfam, 2008

⁵⁵ Tuvalu, 2008

⁵⁶ Müller, 2008a

⁵⁷ See e.g. LDCs, 2008

- c. Maritime levy: Analogue to b. Analogue to a. in case of a GHG-related levy.
 - d. and e. The inclusion of aviation and maritime transport into the ETS: The sale of certificates creates a price signal that reflects abatement costs but fails to guarantee a full internalisation of external costs.
 - f. see b. and c.
- All of these options relate to climate relevant behaviours and therefore conform with the polluter-pays principle in general, but vary with regard to how strict the principle is applied: GHG-based levies perform better in this criterion than just a ticket tax, for example.
- d) *Effects on competition:*
 - The effects in terms of competition are neutral assuming that identical rates are charged in all relevant countries and all of the relevant sectors are included.
 - In fact, the inclusion of air and maritime transport would abandon the Kyoto Protocol's inherent distortion of competition regarding reduction targets and funding contributions, which must be viewed positively.
 - The politically motivated differentiation between countries (as suggested by the Tuvalu proposal) may have higher impacts on international competition, which, however, can be justified politically by the common but differentiated responsibilities principle.
 - e) *Interference with national sovereignty and political feasibility:*
 - a. Kerosene tax/GHG levy: The introduction of a global tax on kerosene cannot be considered a realistic option. In fact, many of the two to three thousand bilateral "Aviation Service Agreements (ASAs)" that are currently in force explicitly prohibit a kerosene tax. Although a universal solution through the ICAO (see Article 2, paragraph 2 of the Kyoto Protocol) is generally feasible, its implementation would encounter severe opposition as shown by past experience (even though generally permitted according to Articles 15 and 24 of the Chicago agreement).
 - b. Charge on flight tickets: Generally feasible, i.e. not prohibited by international aviation law, but probably more difficult to communicate as a climate protection measure than, for example, a direct charge on emissions. However, as a means of resource generation specifically for adaptation purposes communication may in fact be facilitated due to the clear link between the charge and its use to pay for the damages caused by flying. The acceptance of this option differs widely among different countries.⁵⁸ Notably, the LDCs as a group have recently expressed their unified support for a global ticket charge.⁵⁹
 - c. Maritime levy: Addressing this issue globally makes sense, particularly considering the ease of simply changing flags. Another advantage is that private companies instead of governments face the costs, which could facilitate international agreement, since developing countries are mostly unwilling to commit to contributions from their side.⁶⁰
 - d. Inclusion of maritime transport into the ETS: The inclusion is already discussed under the IMO.⁶¹ However, under the UNFCCC the inclusion turns out to be more difficult.
 - e. Inclusion of aviation into the ETS: From 2011 on, aviation will be part of the European ETS. While a global inclusion as a part of the post-2012 regime appears

⁵⁸ Following a French initiative around 13 countries have implemented a charge on flight tickets since 2006. Among those are also several African LDCs that aim at raising funds for the combat against HIV/AIDS as an aspect of the Millennium goals.

⁵⁹ LDCs, 2008

⁶⁰ Whether this is conform with IMO rules remains to be tested.

⁶¹ However, here the revenues are intended to go to a maritime emission mitigation fund, to support mitigation activities in the maritime sector.

less likely, this possibility cannot be completely excluded. The USA is currently discussing a possible inclusion and since the major share of international aviation is within the USA and between the USA and Europe bilateral consultations are crucial in this context. see b) and c).

All in all, interference with national sovereignty can be considered minor since only very specific activities are affected.

- f) *Additionality*: The additionality as compared to the target ODA quota may depend on whether the levies are charged through national or international institutions (for example the International Maritime Organisation, IMO) and how governments consider them in their accounts. One possible procedure would be that airlines transfer the charges directly and independently of national institutions to the international funds (for example the Adaptation Fund under the Kyoto Protocol), which would clearly make them additional. In case the sectors are included in the ETS the money would go through national budgets and count as national contributions (see 3.3), which means that additionality would again need to be defined with reference to an adequate baseline.

3.6 The introduction of a global carbon tax

Relevance in the international discussion: The very detailed Swiss proposal on the introduction of a global carbon tax as a means to finance adaptation measures has brought the issue back on the negotiation agenda.. However, Switzerland has emphasised that a key aspect of the concept is to establish a link between a criteria based approach and the polluter-pays principle, which basically means that the determined obligations to contribute may also be effected differently.

- a) *Expected revenues*: depending on the exact design; Swiss proposal: USD 48.5 billion (USD 2 per ton of CO₂, with a tax free amount of 1.5 t per capita).⁶²
- b) *Predictability*:
- Assuming that all climate relevant activities are covered a high degree of predictability is ensured.
 - The tax rate is fixed, which minimizes the fluctuations that are observable for instruments based on trade due to their dependence on market prices. the same time, this approach might open doors for political manipulation if the tax rate is not specified by international law.
 - As in the case of contributions made from national budgets predictability may be enhanced through internationally binding regulations (including sanctioning mechanisms).
- c) *Climate impact and compliance with polluter-pays principle*:
- Putting a price on carbon incentivises all emitters to enhance mitigation efforts.
 - Whether internalisation of external costs is actually achieved depends on the tax rate.
 - However, the currently most intensely discussed Swiss model does not account for historical responsibilities - however these might be defined - but only considers present emissions levels.

⁶² Switzerland, 2008. According to the Swiss proposal, out of the 48.5 billion, 18.4 billion would go to a multilateral adaptation fund, 12.2 billion to national climate funds in high income countries and 17.8 billion to national climate funds in medium or low income countries.

- d) *Effects on competition:* According to the Swiss proposal the effects on competition can be considered neutral as each ton of CO₂ is taxed at the same rate except for a free exemption of 1.5 ton per capita (this benchmark is derived from scientific findings). As a consequence, LDCs would rightfully be freed from the tax burden due to their very low per capita emissions. Distortions can only be prevented if only “comparable” tax rates could be applied worldwide.
- e) *Interference with national sovereignty and political feasibility:* Although the degree of interference is generally dependent on the tax rate, one can expect it to be significant since all climate relevant activities within the national borders would be affected. Political feasibility is therefore considered low. This situation would probably change if the USA decided to implement a tax on CO₂. Moreover, interference with emissions trading could compromise the instrument’s efficiency.
- f) *Additionality:* Considering the sheer volume of monetary means that is currently under discussion it can be assumed that these resources are additional to ODA obligations. Nevertheless, many industrialised countries push for their deductibility and in the absence of an adequately defined baseline additionality could not be guaranteed.

3.7 The introduction of a “Tobin Tax”

Relevance in the international discussion: Although it is occasionally referred to no country seriously considers this an option in the negotiation process. If at all, the introduction of such a tax is more likely to be agreed on in the context of a reform of financial markets (Bretton Woods II) than in the context of the UNFCCC process.

- a) USD 15-20 billion p.a.⁶³, depending on the tax rate revenues could amount to hundreds of billions.⁶⁴
- b) *Predictability:* Although the tax is due “automatically” the total sum is dependent on the volume of currency transfers. The imposition of such a tax could trigger circumventing behaviour by switching to financial transactions that are not affected.
- c) *Climate impact and compliance with the polluter-pays principle:* Both aspects find little consideration. There is no direct link with the external costs caused by GHG emissions.
- d) *Effects on competition:* If only international currency transactions were affected, distortions in favour of national currency transactions would probably occur. However, such a tax might also help to reduce the volume of distorting speculations.
- e) *Interference with national sovereignty and political feasibility:* The intervention occurs indirectly since primarily private actors are affected. The political feasibility is low considering the current situation of financial markets. Moreover, the introduction of a tobin tax for climate policy reasons is difficult to justify due to a lack of logical interrelation between the two issues.⁶⁵
- f) *Additionality:* Since the money is raised through international markets this option would enable access to a new source of funding that is independent of national budgets and therefore truly additional.

⁶³ According to estimations by the UNFCCC secretary (assuming a tax rate of 0.01 percent on all financial transactions).

⁶⁴ See Felix and Sau, 1996

⁶⁵ Tobin’s intention was to use the tax to increase transaction costs in order to reduce foreign currency speculations. However, empirical evidence shows that an increase in transaction costs indeed lowers transaction volume but at the same time causes volatility to rise. See Aliber et al., 2003.

4 Conclusion

The international response to climate change and the negotiations under the United Nations Framework Convention on Climate Change (UNFCCC) do not only comprise the determination of emission reduction targets and obligations to take certain nationally appropriate actions but another crucial element is the provision of additional financial resources for mitigation (inter alia to promote conservation of tropical forests), technology cooperation and adaptation to the adverse effects of climate change in developing countries. Available studies agree in their conclusion that carbon markets alone (without auctioning) will not generate sufficient resources for covering the anticipated additional costs amounting to hundreds of billions of limiting the rise in global temperature to less than 2°C as compared to pre-industrial levels. Moreover, emissions trading systems on their own are generally not well suited for financing the required measures for adaptation to already unavoidable climate impacts. (Interestingly, market-linked mechanisms such as the sale or auctioning of allowances to governments or private actors may be an important or even the most important source of funding.)

Another point is that the Bali Action Plan creates an explicit, political interdependency between the measurable, reportable, and verifiable (MRV) climate efforts in developing and newly industrialising countries and the equally measurable, reportable and verifiable enabling support measures by industrialised countries in the form of technology cooperation, financing and capacity building. The establishment of this link reflected a key issue in the Bali negotiations that, in fact, almost caused them to fail.

This overall situation explains why in the UN negotiations as well as in the research community multiple approaches to generating additional resources on a sufficiently large scale are discussed at the moment. This discussion paper thoroughly analyses the different models with regards to multiple criteria that are relevant to effectiveness, efficiency and equity of the instruments to generate financial resources, and that were derived from existing international agreements, the UNFCCC or the Bali Action Plan. Although a large variety of ideas exists, it is strategically preferable to focus mainly on one key instrument in a combination of few logically interrelated instruments, since a considerable resistance to the introduction of new financing instruments must be expected. In doing so it is important to test whether certain options are able to generate resources even before a new climate treaty will enter into force in 2013 because developing and newly industrialising countries will need short-term support for the implementation of their climate-friendly development strategies and immediate adaptation measures. Global emissions will have to peak before 2020, and adaptation is already a compulsion for many countries – so no time must be wasted!

All in all, the authors come to the following conclusion:

1. The international sale of national emission allowances, Assigned Amount Units (AAUs), is considered the “first-best” solution (Option 4). This instrument

- is generally able to generate sufficient resources in addition to already existing commitments (particularly to the 0.7% Official Development Assistance target, ODA);
- thereby creates an “automatic” funding mechanism;
- complies with the polluter-pays principle und thus provides incentives for further emission reductions;

- principally acts as an “upscaling” of the approach already implemented by the EU (auctioning combined with earmarking of revenues);
- guarantees the equitable inclusion of all industrialised countries (i.e. all countries that will be assigned absolute emission targets in Copenhagen) but can at the same time be extended to also include sectoral agreements with emerging economies;
- is consistent with the structural approach of the Kyoto Protocol but at the same time broadens it by enabling the inclusion of newly industrialising countries e.g. through sectoral agreements.
- is technically relatively easy to implement.

How governments generate the resources required to purchase the AAUs needed remains in their domain. For example, it can be used to further incentivise emission reductions on a sub-national level by generating the necessary revenues through domestic emission trading auctioning which sets a price for private companies.

This instrument is analysed and discussed with increasing frequency and intensity by multiple countries and it effectively supports the ultimate objective of the UNFCCC which is basically the provision of a public good, namely the avoidance of dangerous climate change (Article 2 of the Convention). The international sale of a portion of the emission allowances that is deducted before these are allocated to the different countries is a model that enables an internationally consistent approach and at the same time generates resources beyond existing government funding.

However, since emission allowances would not be given out for free anymore, governments may be incentivised to commit to less ambitious reduction targets. This evasive behaviour could be effectively avoided by increasing the share of costly AAUs up to 100 percent (in this case possibly at a lower price). The effected revenue stream could moreover be insulated from market price volatility by choosing to sell allowances at a fixed price instead of auctioning them off. However, overall revenues tend to be lower in this case.

To date international aviation and maritime transport is not yet covered by the Kyoto-Protocol but in particular the EU strongly and rightfully supports its inclusion to ensure its environmental integrity. It follows from the polluter-pays principle, equity considerations and the sheer volume of required revenue inflows that these sectors should be obliged to contribute – ideally through their inclusion in an emissions trading system with auctioning of the allowances. Considering the negative experiences made in the past with the climate policies of the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) it is important to ensure the UNFCCC’s strong role in this process.⁶⁶

There are many arguments in favour of combining the international sale of AAUs with the inclusion of international aviation and maritime transport into the trading system. The latter component can thereby be understood as a logical extension to the former one as international aviation and maritime transport are relevant sectors that up to now are excluded from national emissions budgets. It is, however, possible to exempt flights to certain regions, for example, to the Least Developed Countries or the Small Island Developing States, from the auctioning system and impose a certain charge per ticket instead. In this context it is of particular political relevance that the group of Least Developed Countries, containing at the moment 48 countries, support a global aviation level to generate resources for adaptation measures.

⁶⁶ See Article 2, Paragraph 2 of the Kyoto Protocol

2. The second best solution seems to be the **sale of certificates within regional/national emissions trading systems (ETS) (Option 3)** and the earmarking of the generated revenues for international purposes. This approach also promises significant financial flows and it provides additional incentives for reducing emissions. Nevertheless, the costs are solely incurred by affected sectors in those countries that are included in an ETS.

Notably, the second best option could complement the first best solution if governments decided to pass on the ultimate cost burden to the private actors participating in the trading scheme. Moreover, it is theoretically feasible to exempt those countries from the auctioning of AAUs that have already implemented national or regional emissions trading systems for funding. This approach, however, would only be favourable, if these funds were bindingly earmarked by international law. In case that the country does not deliver the promised money, the auctioning of AAUs could be used as a compliance mechanism.

Calculations reveal that this approach has the potential to generate even higher financial flows than the auctioning of AAUs if the share for sale of AAUs is assumed to be lower than 10 percent. According to the EU Commission's initial proposals, in the EU alone up to EUR 50 billion could have been generated through 100 percent auctioning. The ETS only incorporates about 50 percent of the AAUs in the EU, while some of the models currently discussed in the USA even suggest the auctioning of all permits covering all sectors of the USA economy. However, for the purpose of this paper, the contributions to international climate finance, the important factor is the share of revenues that is earmarked and then delivered for international climate protection. In the case of the EU, it has not been exactly determined which share or sum of the revenues will be used for international purposes, but there is little doubt it will be significantly less than 100%.⁶⁷

3. The use of **general national budgets for international climate policies (Option 1)** only complies with the polluter-pays principle in case contribution criteria are defined accordingly. Only through these criteria may the instrument provide additional incentives for further emissions reductions because the ultimate source of funding generally remains open (as it is the case in AAU auctioning). Additional enforcement rules – particularly a credible sanctioning mechanism – would be necessary to build sufficient trust in the realisation of the set targets. This relation of trust has diminished in the past due to the high rate of non-compliance with the 0.7 percent target for ODA. However, the political implementation of such an adequate sanctioning mechanism is considered unlikely. Hence, this option must always be seen in combination with other instruments that additionally safeguard accordance with the polluter-pays principle and determine who ultimately bears the costs.

4. A carbon tax (Option 6) is a very attractive option in theory. However, it is likely to encounter strong resistance from national governments due to sovereignty concerns.

5. All other financing options are dependent on specific circumstances and could at the most be used to complement other funding mechanisms.

6. Negotiations on the introduction of a tobin tax (Option 7) under the UNFCCC cannot be expected, but may continue to play a role in generating additional resources for non-climate ODA.

⁶⁷ Germany for example provides around 30% of the revenues that are used for climate purposes to international measures (and about half of overall 2008 revenues have been used for climate change related activities).

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