

A decorative graphic consisting of a grid of grey dots of varying sizes, with several dots highlighted in red. The dots are arranged in a pattern that roughly outlines the shape of the world map.

# How Much Is 100 Billion US Dollars?

## Climate Finance between Adequacy and Creative Accounting

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- Key questions concerning international climate finance remain unresolved. One such question is whether the 100 billion US dollars per year that industrialised countries have pledged to deliver, starting in 2020, refers to gross or net flows. The High-level Advisory Group on Climate Change Financing (AGF) of UN Secretary-General Ban Ki-Moon made an important contribution to the debate but uses relatively conservative assumptions. If these assumptions are modified, providing 100 billion US dollars of net flows per year appears to be eminently viable.
- When looking at studies on the climate-related financing needs of developing countries, the only interpretation adequate to the problem and the commitments made under the UNFCCC is one based on net transfers towards the 100 billion US dollar commitment.
- The sources assessed by the AGF differ in accordance with the political level – national or international – at which decisions are taken and funds flow into budgets. Governments prefer sources which they can keep under their full control. However, in order to maximise funding reliability it would seem advisable to make the climate regime self-financing by collecting revenues internationally under the aegis of the UNFCCC.



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## 1. Introduction

Climate finance is one of the core issues in the negotiations on a future climate regime. Developing countries have called for the transfer of financial resources from industrialised countries to enable them to engage in mitigation and adaptation actions since the outset of the international climate negotiations at the beginning of the 1990s. The rationale is twofold. First, about three-quarters of the anthropogenic greenhouse gases (GHGs) that have accumulated in the atmosphere since the start of industrialisation were emitted by the industrialised countries. Hence, the industrialised countries are mainly responsible for creating the climate problem. Second, the industrialised countries have a much greater economic capacity for taking action than developing countries, most of which are still struggling to combat endemic poverty, not least due to the legacy of colonial exploitation.

Article 3 of the United Nations Framework Convention on Climate Change (UNFCCC) therefore commits industrialised countries to take the lead in combating climate change. As part of this leadership role, Article 4 of the UNFCCC and Article 11 of the Kyoto Protocol both mandate the Parties listed in Annex II of the Convention<sup>1</sup> to provide »new and additional« financial resources to developing countries to support capacity-building, development and transfer of technologies, mitigation of greenhouse gas (GHG) emissions, adaptation to the impacts of climate change, economic diversification and so on in developing countries (Articles 4.3, 4.4, 4.5 and 11 of the UNFCCC, Article 11 of the Kyoto Protocol).

Despite these commitments, the actual amount of resources provided by industrialised countries so far has been relatively small. The 2010 World Development Report puts the climate finance currently provided by industrialised countries at around 10 billion US dollars annually (World Bank 2010).

However, the environment for the negotiations has changed significantly in recent years. Annual – not cumulative – emissions of developing countries have now surpassed those of industrialised countries and are rising steadily. Strong mitigating actions on the part of developing countries are therefore indispensable to prevent

dangerous climate change, which puts developing countries in a significantly stronger negotiating position than before. As a consequence, the Bali Action Plan adopted at the 2007 UN climate conference in Bali contains the provision of financial resources as one of the key building blocks of the future climate regime, and clearly conditions mitigation actions by developing countries on adequate financial support from industrialised countries.

While there are various negotiation items related to climate finance, they ultimately all relate to two main topics: mobilisation of the needed amount of financial resources and the institutional structure of funding.

As for the mobilisation of resources, at the UN climate conference in Copenhagen the industrialised countries pledged up to 30 billion US dollars for fast-start finance over the period 2010–2012 and a long-term commitment to »mobilise« 100 billion US dollars per year by 2020 »from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources« (UNFCCC 2010). Although not stated explicitly in the text, one may assume that there is an implicit understanding that funding after 2020 will also be at least 100 billion US dollars per year. There was also a general agreement in Copenhagen to establish a new fund. However, developing countries fear that financing will come from existing sources – for example, by relabeling official development assistance (ODA) – instead of being »new and additional«.

To promote the finance discussion, UN Secretary-General Ban Ki-moon in February 2010 established a High-level Advisory Group on Climate Change Financing (AGF). The AGF was chaired by Prime Minister Meles Zenawi of Ethiopia and Prime Minister Jens Stoltenberg of Norway and composed of eminent experts such as George Soros and Lord Nicholas Stern. The task of the AGF was to evaluate options with regard to how to mobilise the 100 billion US dollars pledged in the Copenhagen Accord. The AGF published its report in November 2010 (United Nations 2010). The report concludes that mobilising 100 billion US dollars is »challenging but feasible«. It emphasises innovative public sources that could yield a double dividend in terms of mobilising funds and incentivising emission reductions, such as carbon taxes and auctioning of emission allowances from emission trading systems.

1. These are essentially the member states of the Organisation for Economic Cooperation and Development (OECD) as of 1992, the most wealthy among the industrialised countries.

However, while the AGF report provides an important point of orientation, key questions are still unresolved. One question is whether the 100 billion US dollars are to be taken as gross or as net flows. The pledges from Copenhagen and the following UN climate conference in Cancún are not clear on this point and the AGF report notes that its members were divided on whether gross or net flows should be counted. This issue is relevant, for example, when financing is provided in the form of loans. Should the full volume of the loan be calculated towards the 100 billion US dollars or only the extent to which the terms of the loan are more favourable than commercial loans, the so-called »grant equivalent«?

In addition, the 100 billion dollars are supposed to come from public and private sources, which raises the question of how private finance should be counted. The AGF report notes that here again its members were divided. Yet another question is whether financial flows from emissions trading – such as the Kyoto Protocol's Clean Development Mechanism (CDM) – may be counted towards the 100 billion target. The purpose of the CDM is to help industrialised countries meet their Kyoto targets by allowing them to substitute emission reductions on their own territory by emission reductions in developing countries. That is, emission reductions through the CDM are counted towards industrialised countries' emission targets, not towards the emission reduction pledges of developing countries. Some AGF members therefore held that flows through mechanisms such as the CDM should not be counted. Others were of the opinion that they should be counted as they are policy-driven transfers.

The relevance of these ambiguities is highlighted when one looks at the fast-start finance provided so far by industrialised countries. Most have uploaded data on the website [www.faststartfinance.org](http://www.faststartfinance.org). Many countries indicate that their funding is supposed to leverage additional private financing but do not count this leveraged finance against their pledges. By contrast, Japan counts the full volume of leveraged private finance against its pledge. Japan also counts the full volume of the loans it provides, while for most countries it is not clear whether the provided funding is in the form of grants or loans. Most countries also do not clarify their baseline for determining whether the provided finance is »new and additional«. Observers assume that most of the fast-start finance is actually relabelled ODA. Developing countries

have therefore been highly critical of the fast-start finance provided so far. For example, Indian environment minister Ramesh stated during the Cancún conference that, »The fast-start finance is neither fast, nor has it started, nor is it finance« (The Economic Times 2010). Ramesh and others also reiterated developing countries' position that a satisfactory agreement on climate finance is a precondition for coming to an overall climate agreement.

Agreeing on accounting rules is therefore critical for the success of the UN climate negotiations. This study aims to contribute to this discussion. It first analyses the financing sources identified by the AGF with regard to whether they involve gross or net flows. In addition, the financing pledges from Copenhagen and Cancún are compared to financing requirements. The study synthesises available assessments of the additional financing needs of developing countries that result from shifting from the current high-emission to a low-emission development pathway. These financing requirements also need to be differentiated according to gross and net flows.

Finally, the sources assessed by the AGF differ regarding the political level – national or international – at which decisions are taken and funds flow into budgets. The study will therefore differentiate the sources analysed by the AGF according to the level of decision-making and analyse the impacts of this differentiation.

## 2. Differentiation of Finance Sources According to Gross and Net Flows

### 2.1 Overview of Sources Assessed by the AGF

The AGF distinguishes the following four categories of sources: public sources, development bank instruments, carbon market finance and private capital.

**Public sources** are revenues raised by or from governments and may be used for grants or loans. The AGF estimated all public sources on a net basis and excluded any incidence with regard to developing countries, for example incidence from charges on international aviation and shipping. That is, the estimates include only net transfers to developing countries. The AGF analysed the following sources from which public revenues could be raised:

- Revenues from international auctioning of emission allowances, such as assigned amount units (AAUs) under the Kyoto Protocol. So far, AAUs have been allocated to countries for free, based on their Kyoto targets. In future, part of the allowances might be retained internationally and auctioned.
- Revenues from emission allowances in domestic emission trading schemes (ETS), such as the EU ETS. From 2013, most of the allowances in the EU ETS will be auctioned. Other countries, such as Australia or Japan, may also establish ETS in the coming years.
- Revenues from levies on offsets. Such a levy already exists in the CDM: 2 per cent of the Certified Emission Reductions (CERs) generated by projects are retained and monetised to finance the Kyoto Protocol's Adaptation Fund. This levy on the issuance of CERs could be increased and/or expanded to other mechanisms.
- Revenues from taxes on international aviation and shipping. These could be a levy on fuels or on tickets, or emissions trading could be introduced in these sectors.
- Revenues from wires charges, that is, charges on electricity produced, either per kWh or based on CO<sub>2</sub> emissions per kWh produced.
- Revenues from eliminating fossil fuel subsidies.
- Revenues from royalties or licences on fossil fuel extraction.
- Revenues from a carbon tax levied on emissions from industrialised countries.
- Revenues from financial transaction taxes.
- Direct budget contributions: these are contributions from a country's general revenue through the ordinary budget process. The AGF calculated the potential revenue from this source on the basis of the demand from the G77 and China that industrialised countries should dedicate 0.5–1 per cent of their GDP to international climate finance. However, the AGF considers that, due to political constraints within industrialised countries, this source will probably account for only a subordinate share of the overall funding.

**Development bank instruments** were estimated on both a gross and a net basis. Net flows were determined based on the accepted methodology of the OECD Development Assistance Committee to define the grant equivalent of flows. Development bank instruments are:

- resources development banks can raise based on the assets they already have on their balance sheets. This source was not further analysed by the AGF; and
- resources development banks can raise based on additional funding made available to them.
- Another source may be contributions to a fund based on the commitment of existing or new special drawing rights. However, this source was not further analysed by the AGF as the group was sceptical about the political feasibility of this option.

It is worth pointing out that this »source« operates at another level than the other sources. The increased resources for development banks would have to come from one of the public sources. Hence, development banks are a channel rather than a source of finance.

**Carbon market finance** involves the transfer of resources related to the purchase of offsets by industrialised countries, such as CERs from the CDM. The AGF estimated carbon market flows on a gross basis. In addition, the AGF made a tentative estimate of the net share of such flows based on methodologies proposed by some members. The AGF defined the net share as the inframarginal rent of flows, in other words the difference between the average cost of a mitigation action compared with the market price of emission credits. However, while this concept is easy to define, it is not trivial to estimate the magnitude of inframarginal rents and establish who captures them.

**Private capital** refers to international private finance that flows as a result of interventions by industrialised countries such as risk mitigation or revenue-enhancing instruments or capacity building. Private flows were estimated on a gross basis. Here, too, the AGF made a tentative estimate of net flows based on methodologies proposed by some members. This estimate is based on the fact that private investors often accept a lower return if they benefit from public finance instruments that

reduce investment risks. However, here again it is far from trivial to quantify the achieved reduction in returns and the value that accrues to developing countries.

## 2.2 Potential Revenues from Individual Sources on a Gross and Net Basis

Most of the sources are directly or indirectly related to the carbon market. The AGF used three price scenarios as basis for its estimates of the revenue potential:

- (i) a low-carbon price scenario at US\$10-15/t CO<sub>2</sub>-eq;
- (ii) a medium-carbon price scenario at US\$20-25/t CO<sub>2</sub>-eq; and
- (iii) a high-carbon price scenario at US\$50/t CO<sub>2</sub>-eq.

The low and medium price scenarios reflect prices that can be expected from implementation of the emission reduction pledges made under the Copenhagen Accord and the Cancún Agreements. The high scenario reflects prices that could be expected in 2020 if the pledges were strengthened to be consistent with the 2°C target.

In addition to assumptions on the carbon price, assumptions have to be made on what share of total revenue could be made available for international climate finance. If revenues are collected by national rather than international institutions – for example, auctioning of allowances in a national ETS – one may assume that finance ministers and parliaments will want to retain the major share of the revenue for their national budgets.

Tables 1 and 2 summarise the AGF estimates for each source of finance, as well as some of the key assumptions. As noted above, the AGF estimated all public sources on a net basis, while the other sources were estimated on both a gross and a net basis.

In summary, the AGF concluded that mobilising 100 billion US dollars is »challenging but feasible«. However, most of the assumptions made by the AGF are fairly conservative. First, the AGF focuses its analysis on the medium-price scenario; the high-price scenario is indicated only »for illustrative purposes«. However, as the AGF itself notes, only the high-price scenario is consistent with the 2°C target.

Table 1: AGF Calculation of Public Sources

Public sources	Net (billion US dollars)		
	Low CO <sub>2</sub> price	Medium CO <sub>2</sub> price	High CO <sub>2</sub> price
Auctioning of allowances (2-10 % of estimated auction revenues dedicated to international climate finance)	2-8	8-38	14-70
Levies on offsets (levy of 2-10 % on offset transactions)	0-1	1-5	3-15
International maritime transport (no net incidence on developing countries, 25-50 % dedicated to international climate finance)	2-6	4-9	8-19
International aviation (no net incidence on developing countries, 25-50 % dedicated to international climate finance)	1-2	2-3	3-6
Carbon tax (international tax, 100 % for international climate finance)	10		
Wires charge (100 % for international climate finance)	5		
Removal of fossil fuel subsidies (100 % for international climate finance)	3-8		
Redirection of fossil fuel royalties (100 % for international climate finance)	10		
Financial transaction taxes (no net incidence on developing countries, 25-50 % dedicated to international climate finance)	2-27		
Direct budget contributions (proposal by G77 to dedicate 0.5-1 % of Annex I GDP)	200-400		



Table 2: AGF Calculation of Non-Public Sources

Other sources	Gross (billion US dollars)			Net (billion US dollars)
	Low CO <sub>2</sub> price	Medium CO <sub>2</sub> price	High CO <sub>2</sub> price	
Development bank instruments	Leverage factor 3-4			Leverage factor 1.1 (= grant equivalent)
Carbon market offsets	8-12	38-50	150	8-14 at medium CO <sub>2</sub> price
Private capital (leverage factor 2-4 on public flows and offsets)	n. a.	200	n. a.	20-24

Second, the shares of total revenue allocated to climate finance are mostly fairly low. For example, the AGF assumes that only 25-50 per cent of revenues from international shipping and aviation could be allocated for international climate finance. As such a scheme would have to be administered internationally, it is not obvious why less than 100 per cent of the revenues from a climate policy instrument would be allocated to climate finance.

The AGF cautions against adding up the revenue potential from different sources as they were estimated using different methodologies and are levied from different bases. For example, a carbon tax would probably not be implemented within the scope of an ETS.

However, one may well add up the various public sources that are directly related to the carbon market, as these are each related to a different base. Table 3 recalculates the AGF assessment based on the following assumptions:

- emission reduction pledges will be strengthened to be in line with the 2°C target so that carbon prices will reach USD 50/t CO<sub>2</sub>-eq. in 2020;
- 6 per cent of auction revenues, the median of the range of 2-10 per cent assessed by the AGF, will be made available for international climate finance;
- revenues from international sources such as international aviation and shipping will be allocated fully to international climate finance.

What emerges is that international aviation and shipping alone could already provide half of the pledged sum of 100 billion. To provide the other half, about 7 per cent of

auction revenues would need to be dedicated to international climate finance. It bears noting that these sources are all estimated on a net basis. That is, given the necessary political will, providing 100 billion US dollars of net resource flows to developing countries in 2020 appears to be eminently viable.

It also bears mentioning that, according to the AGF, total auction revenues in 2020 related to domestic emissions of industrialised countries could amount to 700 billion US dollars. This is based on the assumption that all emissions in industrialised countries would be covered by emissions trading systems and that all allowances would be auctioned. This assumption is probably not entirely realistic, but it nevertheless illustrates the potential of this funding source alone.

Table 3: Recalculation of Public Carbon Market Sources According to AGF

Public carbon market sources	Net (billion US dollars)
Auctioning of allowances (6% of estimated auction revenues dedicated to international climate finance)	42
Levies on offsets (retained at current 2% of offset issuances)	3
International maritime transport (no net incidence on developing countries, 100% dedicated to international climate finance)	38
International aviation (no net incidence on developing countries, 100% dedicated to international climate finance)	12
Total	95

### 3. Financing Needs in Developing Countries

#### 3.1 Definition of Financing Needs

International climate finance needs to be underpinned by an understanding of the financing requirements of developing countries in order to be able to assess whether international climate finance is commensurate to needs. In estimating finance needs it is necessary to be very clear what one is talking about. In particular, the question of gross and net flows is often confused in discussions. Representatives of industrialised countries frequently point to the finding of the UNFCCC's report on investment and financial flows according to which 86 per cent of all global investments and financial flows come from private sources (UNFCCC 2007). On this basis, industrialised countries argue that most of the financing needs can be met from private sources.

However, there are various layers of financing needs which should not be confused with each other (Melle et al. 2011):

- Total investment refers to the totality of initial funding needed to invest in an asset, for example a power plant. Globally, even under »business as usual«, hundreds of billions of dollars will need to be invested annually in energy infrastructure, for example to satisfy the rising energy demand in developing countries and replace outdated plants in industrialised countries. In their World Energy Outlook 2010, the Organisation for Economic Cooperation and Development (OECD) and the International Energy Agency (IEA) project that, even without increased mitigation actions, cumulative energy-related investment of 33 trillion US dollars will be needed over the period 2010-2035 (OECD/IEA 2010).
- By contrast, incremental investment is the difference between the initial investment needed for a low-carbon asset and the initial investment needed for a conventional one: for example, the incremental investment needed for building renewable energy installations instead of an equivalent coal power plant. Incremental investments are hence only a fraction of total investments.
- A further layer is the incremental cost. The initial investment needed for renewable energy installations is usually higher than for conventional energy installa-

tions but operating costs are usually lower, as most renewable energy installations incur no fuel costs. Similarly, the initial investment for energy efficient assets is usually higher than the investment needed for less efficient ones, but the higher efficiency leads to lower operating costs. Incremental costs of an asset are hence calculated as the net present value of all related cash flows over its lifetime (including investments, operating costs/gains and sometimes also capital costs). Incremental costs are usually lower than incremental investments in low-carbon assets due to lower operating costs. For many mitigation actions incremental costs are even negative as lifetime savings are higher than the incremental investment, especially in the case of efficiency improvements.

Discussions of international climate finance are clearly predicated on incremental investment and incremental cost, not total investment. Naturally, it is typically not governments but private actors who finance investments for insulating houses or building wind parks. But it cannot be expected that private businesses will reduce their profit margin and simply absorb the costs caused by choosing a less GHG-intensive investment. In addition, even where incremental costs are negative the higher initial capital expenditure required for many low-carbon technologies constitutes a formidable investment barrier, in particular in developing countries with limited access to capital. Experience from industrialised countries shows that, even where investments are in principle profitable, implementation is often difficult nevertheless. Industrialised countries dispose of gigatonnes of no-regret or even win-win potential that would generate a net economic benefit, and yet have so far not been very successful in actually achieving their pledged emission reductions. Typically, a whole range of formidable financial, institutional, technical, information and capacity barriers prevent implementation, such as limited awareness of options, split incentives (such as landlords unwilling to pay for efficiency measures that lower tenants' energy bills but without any benefit to themselves, while tenants are unwilling to invest in improvements that revert to the landlord on lease expiry), limited access to capital or small project sizes coupled with high transaction costs. Just as industrialised countries will have to significantly scale up policies and measures, including public financial support to market actors to tap their own emission reduction potential, developing countries will require significant capacity building and financial support for policies and measures to mobilise their potential.



### 3.2 Estimates of Financing Needs

In what follows we synthesise a number of studies on financing needs in developing countries published in recent years.

As already noted, the World Energy Outlook 2010 projects that cumulative investments of 33 trillion US dollars will be needed globally over the period 2010-2035, even without increased mitigation actions. Of this, about 17 trillion US dollars are projected for Asia, the Middle East, Africa and Latin America. Shifting to a pathway that would allow stabilisation of GHG concentrations at 450ppm CO<sub>2</sub>-eq., which gives roughly a 50:50 chance of meeting the 2°C target, would require an incremental investment of 13.5 trillion over the same time period globally (that is, total global investment would rise to 46.5 trillion US dollars). Approximately half of this incremental investment – about 8 trillion US dollars – would have to be made in developing countries.

Projected incremental investment in 2020 amounts to about 400 billion US dollars, with a share of around one-third in developing countries. However, the 450ppm scenario's projection until 2020 is based on the Copenhagen pledges. These are too weak for achieving a cost-effective 450ppm stabilisation pathway. A cost-effective 450ppm pathway would involve higher investments up to 2020 and lower investments thereafter. The IEA estimates that the difference between its Copenhagen-based scenario and a cost-effective 450ppm scenario (as calculated in their pre-Copenhagen World Energy Outlook) amounts to cumulatively 1 trillion US dollars over the period 2010-2030. It should also be noted that these estimates concern only energy-related emissions: other emission sources such as waste, agriculture and deforestation are not included.

Based on an analysis by McKinsey, Project Catalyst (2010) estimates that total investments of about 290 billion US dollars per annum by 2020 will be needed for low carbon energy infrastructure in developing countries to move to a 450ppm pathway. Project Catalyst estimates the incremental costs of actions in developing countries at 60 billion US dollars per year in 2020.

The World Bank's 2010 World Development Report synthesises about a dozen studies, including additional data obtained from the respective authors. The World Bank

puts incremental costs in developing countries at between 140 billion and 175 billion US dollars annually by 2030, with associated incremental investments of 265 to 565 billion a year. Figures for incremental investments by 2020 range between 63 billion and 300 billion US dollars a year, while no figures for incremental costs are given.

The 2010 World Development Report also synthesises figures for adaptation costs but the World Bank notes that these were mostly derived from rules of thumb and are dominated by the cost of climate-proofing future infrastructure. They do not take into account the diversity of the likely adaptation responses, such as changes in behaviour, innovation, operational practices or locations of economic activity. They also usually do not include non-market impacts, such as those on health systems and natural ecosystems. While some of these factors could reduce adaptation costs – for example, by reducing the need for costly infrastructure – others would increase them. With this caveat, the cited figures range between 5 billion and 105 billion US dollars of incremental investments annually in the period 2010-2015, or 15 billion and 100 billion US dollars annually by 2030 (World Bank 2010).

A similar criticism of the available studies on the costs of adaptation was made by Parry et al. (2009). They allege that the available studies do not include all relevant sectors; that some of the included sectors have been only partially covered; and that the additional costs of adaptation have sometimes been calculated simply as a »climate mark-up« of low levels of baseline investment. On the last point, they argue that underinvestment is precisely what is leading to adaptation deficits, and that this deficit will need to be compensated by full funding of development, without which the funding for adaptation will be insufficient.

While these estimates of adaptation and mitigation costs cover a broad range, one point emerges clearly: the total needed investments for adaptation and mitigation in 2020 are many multiples of 100 billion and the needed incremental investments are also likely to be several multiples of 100 billion. The median value of the estimates for incremental mitigation investments in 2020 is about 200 billion US dollars and the median of incremental adaptation investments is about 50 billion US dollars.



Table 4: Climate Finance Needs in Developing Countries

Study	Total investment	Incremental investment	Incremental cost
Mitigation			
World Energy Outlook 2010 (energy investment based on Copenhagen pledges)	Up to 400 billion in 2020	About 130 billion	n. a.
Project Catalyst 2010 (energy investment for cost-effective 450ppm pathway)	n. a.	290 billion p. a. by 2020	60 billion
World Development Report 2010 (synthesis of various other studies)	n. a.	63-300 billion in 2020 265-565 billion in 2030	No figures for 2020 140-175 billion in 2030
Median	n. a.	200 billion in 2020	n. a.
Adaptation			
World Development Report 2010 (synthesis of various other studies)	n. a.	4-105 billion in 2010-2015 15-100 billion in 2030	n. a.
Median	n. a.	50 billion in 2020	n. a.

The only interpretation of the developed countries' commitment that is adequate to the problem at hand is therefore to see it as funding to cover incremental costs and leverage the needed additional investment of several hundred billion dollars per year. Thus, the 100 billion US dollars need to be counted on a net, not a gross basis.

#### 4. Implications for Political Decision-Making Processes

The sources assessed by the AGF differ regarding the political level – national or international – at which decisions are taken and funds flow into budgets. In what follows we detail the respective national and/or international processes related to each funding source.

*Auctioning of international emission allowances:* The decision to auction international emission allowances, such as AAUs under the Kyoto Protocol, would be taken at the international level. The costs would have to be borne by the governments of industrialised countries and revenues would accrue to the entity that auctions the allowances, most likely an international fund.

*Auctioning of national emission allowances:* The decision to auction emission allowances in a national ETS is

taken by the respective national government. The costs would be borne by the installation operators concerned and the revenues would accrue to the national government.

*Levies on international offset mechanisms:* These by definition are levied internationally. Under the CDM, 2 per cent of CERs are retained, that is, they are not issued to the project participants who finance the project. The CERs are monetised by the World Bank to finance the Kyoto Protocol's Adaptation Fund. However, the World Bank only acts as trustee; funding decisions are made by the Adaptation Fund Board, which consists of 16 members elected by the Parties to the Kyoto Protocol.

*Taxes on international aviation and shipping:* These could be organised nationally or internationally. While the decision to tax would be taken internationally, the revenues could accrue either to an international institution or to the countries where fuels are sold, flights take off, tickets are sold and so on, depending on the design. The taxes would be paid by international aviation and shipping companies.

*Wires charges:* The decision to levy a charge on electricity production might be taken internationally but implementation would have to go through national governments. In theory, the revenue could accrue to in-



ternational or national budgets, but in practice national governments would probably resist passing on the revenue they accrue.

*Fossil fuel subsidies:* These are provided nationally, so it would be up to national governments to eliminate them. These funds could then be directed to other purposes via normal budget procedures.

*Royalties or licences on fossil fuel extraction:* Revenues from royalties or licences on fossil fuel extraction accrue to national governments and are usually a part of general government revenue and hence part of the normal budget procedures.

*Carbon tax:* The decision to levy a uniform carbon tax would be taken internationally. Similar to the auctioning of international emission allowances, the costs would have to be borne by the governments of industrialised countries and revenues would probably accrue to an international entity.

*Financial transaction taxes:* The decision to levy taxes on financial transactions would be taken internationally and implementation would probably be entrusted to an international institution, such as the International Monetary Fund.

*Direct budget contributions:* These are defined as contributions from a country's general revenue through the ordinary budget process.

*Development bank instruments:* As already pointed out, development banks are not a source but rather a channel of finance. The decision-making process would hence depend on which source the funding comes from. Increased funding could either be made available through the ordinary national budget process of donor governments, or some of the revenue accrued from one of the innovative public sources discussed by the AGF could be allocated to the multilateral development banks.

*Carbon market finance:* The transfer of resources related to the purchase of offsets is a market transaction. The costs are borne either by private companies or by governments that purchase offsets to comply with their Kyoto targets. In the latter case funding decisions are made through the normal national budget processes.

Private capital by definition comes from private sources so political decision-making processes are not affected.

Table 5: Finance Sources, Related Decision-Making Processes and Incidence

Source	Level of decision-making	Incidence
Public sources		
Auctioning of international allowances	International	National governments
Auctioning of national allowances	National	Companies covered by an ETS
Levies on offsets	International	Actors engaged in offset mechanisms
International maritime transport	International	Maritime transport companies
International aviation	International	Aviation companies
International carbon tax	International	National governments
Wires charge	International	National electricity producers
Removal of fossil fuel subsidies	National	National recipients of subsidies
Redirection of fossil fuel royalties	National	National producers of fossil fuels
Financial transaction taxes	International	International finance companies
Direct budget contributions	National	National governments
Other sources		
Development bank instruments	Donor governments	Donor governments
Carbon market offsets	Actors engaged in offset mechanisms	Actors engaged in offset mechanisms
Private capital	Private companies	Private companies

These differences raise questions of political acceptability and practical viability. Revenue sources at national level are much more acceptable to governments than

international sources because they can be better controlled by national administrations. Even within the EU, member states have so far rejected all suggestions to create new funding sources for the EU institutions that are independent of national processes.

On the other hand, revenues that accrue at national level are likely to be pocketed by finance ministers. Again the EU example is illustrative. In the current trading phase of the EU ETS, member states may auction up to 10 per cent of allowances and several member states, including Germany, are doing so. Thus, the EU is already implementing one of the funding sources discussed by the AGF. However, most of these revenues accrue to the general national budgets of member states and only a minor share is used for climate purposes. Starting in 2013, most of the allowances in the EU ETS will be auctioned. However, member states rejected all suggestions to earmark a share of these revenues for climate finance. Instead, the EU directive only includes a non-binding suggestion to use at least half of the revenues for climate-related purposes.

If revenues are collected internationally – for example, through international auctioning of allowances or the introduction of new mechanisms for international aviation and shipping – the climate regime could in principle be made self-financing. However, the difficulties encountered in introducing such mechanisms have in part been due precisely to the fact that these funding streams would not be under the control of national governments.

## 5. Conclusions

Clear accounting rules for international climate finance are crucial both for the sake of transparency and for generating political trust between countries, as well as for making sure that financial flows are actually adequate to the task of achieving sufficiently strong emission reductions and adaptation to the impacts of climate change. So far, financial resources provided by industrialised countries have been of a relatively limited volume and transparency has been lacking.

Industrialised countries have pledged to mobilise 100 billion US dollars by 2020. The AGF has assessed a variety of potential funding sources and concluded that achiev-

ing this goal is challenging but feasible. However, it is not clear whether the 100 billion pledge relates to gross or net flows. The Copenhagen Accord and the Cancún Agreements leave this question open, and the AGF was also not able to decide in favour of one or the other interpretation.

Looking at the AGF assessment it is noteworthy that the underlying assumptions are fairly conservative. The AGF focuses its analysis on a medium-range carbon price that is not in line with achieving the 2°C target and assumes that only relatively low shares of revenues from carbon markets could be dedicated to international climate finance. If one assumes – perhaps hopefully – that emission caps will at some point be brought in line with the 2°C target and that revenues from international sources, in particular carbon-related sources in international transport, will be fully dedicated to climate finance, mobilising 100 billion US dollars does in fact appear to be eminently viable. International aviation and shipping alone could provide as much as half of this amount and only a relatively minor share of 7 per cent of the revenues of auctioning allowances in industrialised countries would be needed for the other half. What is more, this would amount not to a gross but to a net transfer of 100 billion US dollars.

When looking at the climate-related financing needs of developing countries, counting only net transfers towards the 100 billion commitment does in fact appear to be the only interpretation adequate to the problem that must be solved. Studies by the OECD/IEA, the World Bank and others indicate that 100 billion is likely to be the order of magnitude of the incremental costs alone, while related incremental investments are likely to amount to several hundred billion per year and related total investments are many multiples of 100 billion. Counting the full volume of loans and private investments towards the 100 billion commitment would therefore amount to substantially undersupplying actual financing needs.

The sources assessed by the AGF differ regarding the political level – national or international – at which decisions are taken and funds flow into budgets. Governments clearly prefer sources which they can keep under their full control. However, in order to maximise the reliability of funding it would seem advisable to make the climate regime self-financing by collecting revenues



internationally under the roof of the UNFCCC. The example of the EU ETS shows that if revenues are collected nationally, probably only a very minor share will be allocated to international climate finance.

Finally, one should also look beyond 2020. This analysis has strongly emphasised the substantial revenue potential of auctioning emission allowances. However, as caps are further tightened the amount of allowances that are available for auction will decrease. In the short and medium term this may be compensated by the corresponding increase of the carbon price but in the long term the revenue potential is likely to decline. However, adaptation needs and damages from climate change impacts will substantially increase over time. Attention should therefore also be paid to tapping new sources of finance that are not tied to the dwindling supply of emission allowances. Prime candidates appear to be financial instruments connected to financial markets such as financial transaction taxes and the use of special drawing rights. At the moment, the political resistance to introducing such instruments is substantial but over time the growing financing needs related to climate change and other global concerns may leave no other option.



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