

International climate financing

From Cancún to a 2°C stabilisation pathway



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From Cancún to a 2°C stabilisation pathway

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Executive Summary

The UN climate conference in Cancún, in December 2010, has put the international community back on track, to eventually limit the global temperature increase to 2° Celsius or lower. This 2° stabilisation pathway will require a substantial international effort and significant financing.

This paper, commissioned by KfW Development Bank, assesses the issues related to international climate financing. It examines potential sources of revenues and analyses which instruments are most compatible with these sources and the climate objectives. Ultimately, the paper provides suggestions for progress in international climate financing after Cancún, towards a 2°C stabilisation pathway.

Cancún: a new pragmatism

Despite a detrimental turn in Copenhagen in 2009, the UN climate conference in Cancún reinstated the 2° stabilisation pathway in the 'Cancún Agreements'. The conference acknowledged that the current level of climate change mitigation is insufficient to meet the 2° goal and it called for urgent action. To undertake mitigation activities and help developing countries to address climate change impacts, developed countries have restated their commitment to mobilise US \$100 billion for climate change mitigation and adaptation activities, every year from 2020.

However, the modalities and characteristics of providing this funding of US\$ 100 billion per year have not been defined yet. It may include a wide variety of sources, public and private, bilateral and multilateral, including alternative sources. It was agreed that a share of this funding – with priority on adaptation – should be channelled through a UN-governed Green Climate Fund which could be a new vertical fund but also a more decentralised structure relying on proven implementation capacity.

Following the Copenhagen Accord (December 2009), the UN Secretary-General asked the High-Level Advisory Group on Climate Change Financing (the 'AGF') to investigate the possibilities of scaling up long-term financing for mitigation and adaptation strategies in developing countries from various public and private sources, and how best to deliver it. The Advisory Group identified and discussed various new sources of revenues that could help to mobilise US\$ 100 billion by 2020. However, many questions were still left unanswered.

Using limited public resources to leverage green investments

To achieve the 2°C stabilisation pathway, public financial resources must be utilised to stimulate investment in low-carbon alternatives. An integral part of this process is to provide incentives to redirect existing investments towards low-carbon alternatives.

Figure 1 is a general overview of the financial flows involved. Governments and other public institutions raise revenues from 'public sources' (1st column). These sources are not specifically defined in the Cancún Agreements.

These public resources are largely implemented by public sector finance institutions and development agencies (2nd column). The Cancún Agreements include the establishment of a 'Green Climate Fund' (GCF) which will be an important additional element of this financial architecture, particularly for adaptation. A large share of the available resources is currently channelled through a wide range of bilateral and multilateral institutions, largely within the existing frameworks of Official Development Assistance (ODA). This architecture provides the starting point for the further evolution of a system for the delivery of public climate financing.

The organisations within the financial architecture use various instruments to stimulate mitigation and adaptation activities (3rd column). Here, mainly instruments able to influence investment from the private sector are listed (the 4th column). The Cancún Agreements do not specifically discuss the use of these instruments.

An additional source of financing for developing countries is the carbon market which taps into private and public sources. Through offset schemes, carbon markets can create a demand for carbon credits from mitigation projects in developing countries.

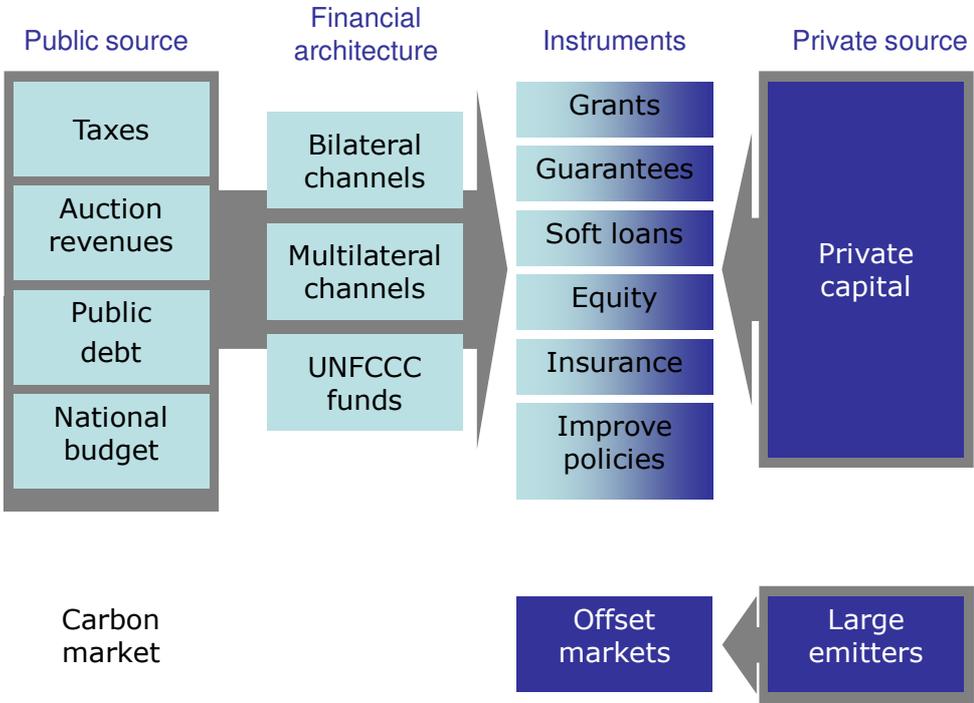


Figure 1: Scope of this paper - Sources, financial architecture, instruments and private sources

Sound assessment of financing needs and transparency on current flows

The term, 'climate financing' usually includes financial flows for reducing emissions, i.e. mitigation, as well as measures for adapting to the consequences of climate change, but there are no clear definitions. Climate financing can be viewed, either as comprising of only the flows from developed to developing countries or flows within and between all countries.

Regarding the US\$ 100 billion, it is not yet clearly defined what kinds of types of funding will be counted towards this objective. No agreed definitions yet exist to assess and describe current flows and climate financing needs in a comparable and transparent manner.

This paper differentiates between at least three different ways of describing current and eventually needed financial flows for mitigation:

- The *total investment* made into low-carbon assets is currently estimated globally at US \$100 to 300 billion per year. For a 2°C stabilisation pathway, investments of approximately US \$1 trillion per year, globally, will be necessary.
- The *incremental investment* is the difference between the initial investment of a low-carbon asset and that of a comparable conventional asset. This is usually a much smaller figure than the total investment. Estimates of incremental investments costs for a 2°C stabilisation pathway range from US \$50 to 400 billion per year, globally, in 2020.
- The *incremental cost* is the difference between the Net Present Value of all cash flows generated by a low-carbon project over its lifetime (investments, operational costs/gains, sometimes also capital costs) and that of a comparable conventional project. This is usually a smaller number because the low carbon projects usually have lower operating costs. An estimate for the incremental cost of today's action is not available. Estimates for incremental costs of the 2°C stabilisation pathway needs range from US \$50 to 130 billion per year in 2020.

Different definitions lead to significantly different figures. The amounts also represent different phases in projects. *Incremental investment* appears earlier than the *incremental costs*, which are spread over the lifetime of the project.

The Cancún Agreements have not stated, for either mitigation or adaptation, whether the agreed financing of US \$100 billion applies to 'investments' or 'incremental costs'. The AGF report describes the divergent views of its members: some took the view that it should be calculated on the basis of incremental costs as grant equivalents and others did not.

The *current* climate-relevant financial flows, from developed countries to developing countries, are significant. A considerable amount of mitigation and adaptation related financing already flows through existing development institutions. Multilateral development banks (MDBs) and bilateral financial institutions (BFIs) provided a total flow of climate-relevant development support (loans and grants) of approximately US \$20 billion in 2009. Most of this is attributed to the investment costs of low-carbon and climate resilient projects and a smaller amount to only additional costs.

An annual average of US \$10 billion was promised over the years 2010 to 2012 by developed countries, to provide 'fast start' finance for implementing mitigation and adaptation activities in developing countries. In 2010, approximately US \$10 billion were reported by individual countries as fast-start financing, both as grants and loans. This financing was largely provided within the framework of Official Development Assistance, using the established bilateral and multilateral channels. There is a heated discussion on what proportion of these pledges is "new and additional" and what "new and additional" actually means. Estimates range from 0% to 100%.

In addition, funding is available for investment in the carbon market through the clean development mechanism (CDM) and activities covered by voluntary carbon market standards. The *value* of CDM credits issued in 2010 is approximately US \$5 billion and the total *investment* triggered by CDM projects registered in 2010 is approximately US \$23 billion.

Independent of the definition of climate financing, the international community will need to mobilise significant additional financing to provide what is necessary for a 2°C stabilisation pathway. However, for obvious transparency and monitoring reasons, clarification of the definition of 'climate financing' will be necessary.

Mobilising public resources

Public funding for climate change can be mobilised from national budgets in analogy to or as part of official development assistance (ODA). However, national and international politics could make it difficult to generate sufficient and reliable public financial flows in the required order of magnitude. So far, only revenues of carbon credit auctions and, indirectly, carbon taxes have qualified as additional sources.

Public debt is also a source and can be used in several ways, usually as concessional loans. These loans will need to be paid back and cover the public debt. Still such loans can have a significant 'grant equivalent' effect. From a project perspective, such loans would lower the cost of capital. Both public sources, such as taxes, carbon auctions and allocation of national budgeting, and private sources, through carbon markets or regulation, can cover further incremental costs.

In the short term, the mobilisation of public sources is expected to be primarily a national activity. This can only become internationally coordinated if and when international policy structures become more stable.

Climate financing will cover both adaptation and mitigation projects. Adaptation activities are relatively costly and will largely rely on public financing. This will leave limited resources for mitigation activities and will increase the need for a high leverage of private capital. The AGF report also concludes that the concept of using public finance to attract even greater private finance is increasingly accepted by the international community.

Assuming that climate is a key policy priority, an important instrument for mitigation could be to ensure that the *existing* public financing is positively stimulating low-carbon development. For example, the carbon-intensity of a project could be one criterion for the allocation of development assistance alongside of other criteria. In addition, subsidies for fossil fuels should be phased out as soon as possible, in a socially responsible way. This would have the double effect of freeing up resources and decreasing the costs difference between conventional and low-carbon investments. Fossil fuel subsidies were estimated to be approximately US\$ 312 billion in 2009.

Tailoring the instruments mix to specific circumstances

The primary financial instruments used to trigger the reduction in greenhouse gas emissions are grants, guarantees, concessional loans, insurance, equity and policy improvement. The efficiency and effectiveness of each of these instruments depend on the specific situation, e.g. the commercial maturity of the supported activity, the sector in which it is applied and the country where the activity takes place.

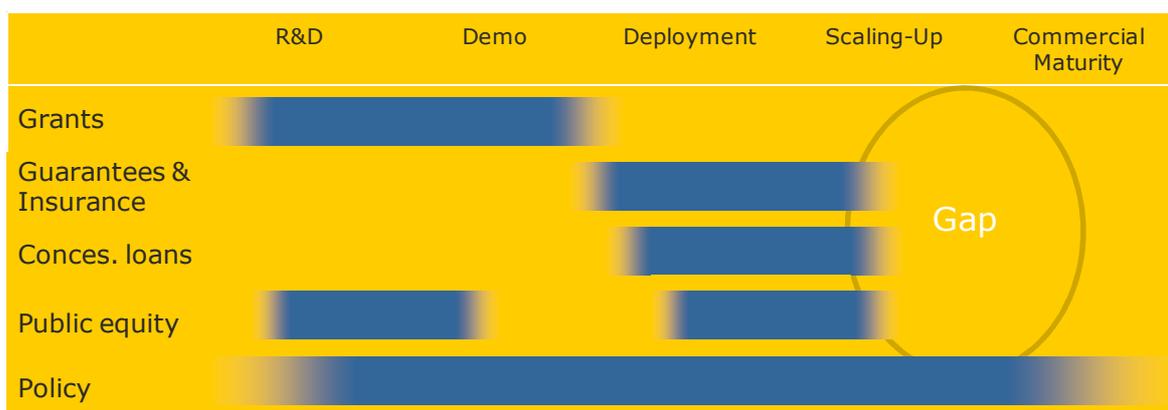


Figure 2: Instruments used in phases of activity development

The most difficult stage in financing mitigation measures is the scaling-up of mitigation activities. In this stage, large sums of investments are needed for technologies and activities that often are not entirely proven. Private investment is

particularly important in this phase because it stimulates the operational efficiency and market knowledge that are the prerequisites for a successful roll-out of new technologies. Whenever the activities are relatively competitive with conventional technologies, no or little public support will be required, but in most situations, public financing is needed. Looking at the general application of instruments, there is currently a gap in support at this stage. Additional instruments should reduce the risk of the investments. These could be public equity, insurance & guarantees and public policies.

Appropriate national policies are important at each stage of activity development. These policies ensure that the required regulatory frameworks are in place and are stable, which is necessary to attract private investment. The development of these policies can be supported with grants or development loans. The most important prerequisite for developing the appropriate policy is strong and broad political support in the host country.

Building on existing experience

Two examples of instruments for use of public money that are already used to scale-up climate-friendly investments:

- **Green concessional lending** - Multilateral and bilateral development banks (MDB/BFIs) use public guarantees and risk compensations to make low interest rate loans available for green investments.
- **Public private funds** - Governments take a first-loss, lower profit or no-profit equity stake in a fund structure that provides loans or equity to green investments. This risk buffer makes investments more attractive at low returns for private investors.

Move quickly and act boldly

To maintain progress towards a 2°C scenario, the current level of climate change financing is clearly not sufficient. Global greenhouse gas emissions will have to peak before 2020, so time is limited. Also, considering that carbon-intensive investments made today can have an impact for over 30 years, the global community must take decisive action now.

This requires a swift scaling-up of current activities in parallel to building new institutions and processes where needed. More public initiatives and resources are required to direct private investment to climate-friendly developments. A significant scaling-up of mitigation activities must take place in the next few years. In this “learning period”, ambitious front runners are necessary to demonstrate the positive effects of mitigation and adaptation activities undertaken by developing countries with developed country support.

For short-term progress, starting in 2011, we recommend the following paths of action to the stakeholders in the international community of climate change financing:

- Build on the new pragmatism demonstrated in Cancún and move quickly
- Develop consistent definitions of climate financing flows, investments and incremental costs to derive comparable information on current flows and needs
- Mobilise additional and redirect existing public resources for efficient and effective mitigation and adaptation on a 2°C stabilisation pathway
- Use limited public resources efficiently as well as carbon markets in order to leverage private sector green investments
- Use a mix of financial support instruments to share costs and risks of projects and programmes between public and private sector in industrialised and developing countries
- Build on existing experience, coordinate existing and new implementation channels

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1 Introduction

In December 2010, the Parties to the United Nations Framework Convention on Climate Change came together in Cancún, Mexico. Through the main outcome of the conference, the Cancún Agreements (UNFCCC 2010a), the Parties agreed that global average temperature increase must be limited to 2 degrees Celsius (°C). Also, in calling for urgent action to meet this 2°C goal, they acknowledged that the current level of climate change mitigation is insufficient to achieve this. This result has put the international community back on a path towards limiting global temperature increase to 2° Celsius, the '2°C stabilisation pathway'.

To enable the developing countries to carry out both the mitigation activities necessary to achieve this and the activities necessary to adapt to inevitable climate change, the developed countries restated their commitment to mobilise US \$100 billion per year by 2020. This financing may come "from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance".

After the developed countries first committed to this financial support in the Copenhagen Accord (UNFCCC 2010b), the Secretary-General of the United Nations established a High-Level Advisory Group on Climate Change Financing (the "AGF"). The AGF was tasked with studying the potential sources of revenue for financing mitigation and adaptation activities in developing countries.

The Cancún conference took note of "the relevant reports on the financing needs and options for mobilisation of resources to address the needs of developing country Parties with regard to climate change adaptation and mitigation, including the report of the AGF". This means that the work of the AGF, although acknowledged, was not given a particular status.

This paper considers the findings of the AGF¹, its conclusions on likely sources for climate change financing, and what these imply for a way forward from the recent 'Cancún agreement'. It also examines the possibilities for managing and disbursing the financial flows necessary to maintain the international community on its 2°C pathway.

¹ <http://www.un.org/wcm/content/site/climatechange/pages/financeadvisorygroup/pid/13300>

Figure 3 illustrates the scope of this paper. After providing some background information about the current state of climate change financing in section 2, it will begin with a description of the public sources of climate financing in Section 3. It will then describe the instruments that can be used to disburse the available public finance as effectively as possible in section 4. As a process that stands apart from the main financial structure, the paper will also discuss the carbon markets as a source of financing for developing countries.

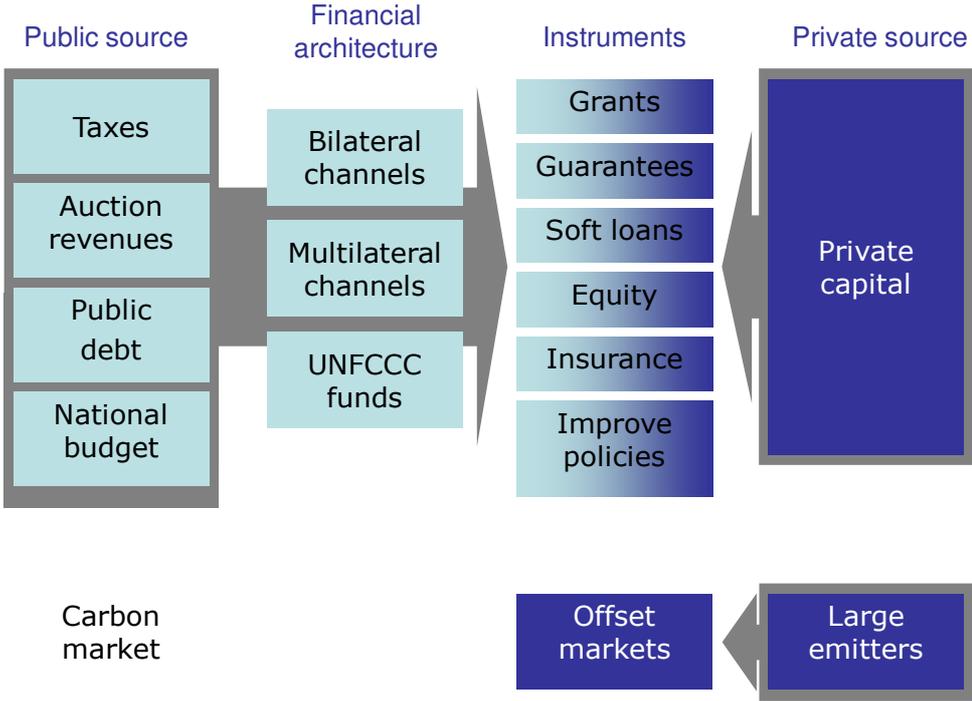


Figure 3: Scope of this paper: sources, intermediaries, instruments and private sources

2 Background

This chapter provides background information on the current state of climate financing. It will outline the estimated financial needs for mitigation and adaptation activities, the currently available financial resources and the options for financing structures that are currently being discussed in the international community.

2.1 Climate financing – What does it mean exactly?

There has been an ongoing debate about financing climate change activities. At a business and academic level as well as a political level, the definition of 'climate finance' and the respective 'finance needs' is not clear.

The term, 'climate financing' usually includes financial flows for reducing emissions, i.e. mitigation, as well as measures for adapting to the consequences of climate change, but there are no clear definitions. Climate financing can be viewed either as comprising of only the flows from developed to developing countries or flows within and between all countries.

Current and future financial flows necessary for mitigation can be described in at least three different ways (see Table 1 for an overview):

- The *total investment* made into low-carbon assets is currently estimated globally at US \$100 to 300 billion per year. For a 2°C stabilisation pathway, investments of approximately US \$1 trillion per year, globally, will be necessary.
- The *incremental investment* is the difference between the initial investment of a low-carbon asset and that of a comparable conventional asset. This is usually a much smaller figure than the total investment. Estimates of incremental investments costs for a 2°C stabilisation pathway range from US \$50 to 400 billion per year, globally, in 2020.
- The *incremental cost* is the difference between the net present value (NPV) of all cash flows generated by a low-carbon project over its lifetime (investments, operational costs/gains, sometimes also capital costs) and that of a comparable conventional project. This is usually a smaller number because the low carbon projects usually have lower operating costs. An estimate for the incremental cost of today's action is not available. Estimates for incremental costs of the 2°C stabilisation pathway needs range from US \$50 to 130 billion per year in 2020.

To illustrate the difference in incremental costs, Figure 4 shows the initial investment and the subsequent cash flows (operational costs/gains and capital costs) of a conventional asset, in comparison to those of a low-carbon asset. The figure shows the typical situation where the initial investment for a low-carbon asset is higher than for a comparable conventional one. It also shows a typical situation where the positive cash flows after investment from a low-carbon asset are often higher, due to less fuels

or energy used. As time progresses, the gains more and more cover for the initial investment (shown as cumulative cash flow lines in the figure). The difference of the cumulative cash flow (usually presented as NPV) of the conventional and the low carbon project is the 'incremental cost'.

Any incremental cost calculation therefore heavily depends on several assumptions: future energy prices, the lifetime of the project and the discount rate used when calculating the NPV. Commercial calculations also include the capital costs (expected return on debt and equity), which can be significantly higher for low-carbon projects compared to conventional ones, because of differences in perceived or real risks.

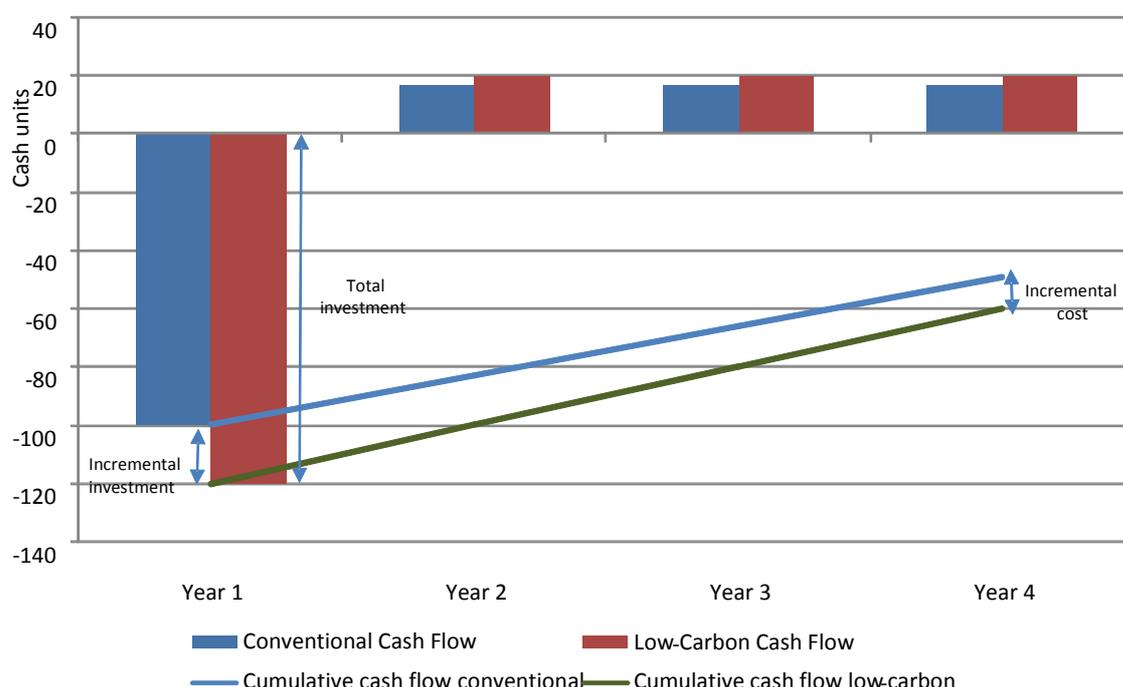


Figure 4: Total, incremental costs and investments

		Current (US\$ billion p.a. in 2009)		Needs for a 2°C pathway (US\$ billion p.a. in 2020)	
		In developed countries	In developing countries	In developed countries	In developing countries
Mitigation	Total investments in low carbon assets	100 – 300		around 1000	
	Incremental investments	-	-	-	300 – 600
	Incremental abatement costs	-	-	-	50 – 200
	Fossil fuel subsidies	300		-	-
Adaptation		-	-	-	10 – 250

Table 1: Overview of current climate financing and needs from various viewpoints (Sources: Bloomberg 2010; den Elzen et al. 2010; IEA 2010; Parry et al. 2009; Project Catalyst 2010a; UNFCCC 2008)

Table 1 provides an overview of estimates for climate financing needs. Different definitions lead to significantly different figures. The amounts also represent different phases in projects. *Incremental investment* appears earlier than the *incremental costs*, which are spread over the lifetime of the project.

Table 1 also includes an estimate of subsidies for fossil fuels for comparison. These are estimated to have amounted to approximately US \$312 billion, globally, in 2009 (IEA 2010), which is a similar amount to, or higher than the global incremental costs in 2020 necessary for a 2°C pathway.

Private investors will be willing to provide capital for the initial investment (equity and debt) as long as it provides a return that is relative to the risk that is involved. It can be raised by redirecting existing investment.

The main challenge is to find the best use of public resources to bring the risk-return level of low-carbon investment closer to the level of conventional investments. This paper will concentrate on how this can be achieved.

2.2 Current support for developing countries

Developed countries are committed to provide US \$30 billion a year from 2010 to 2012, as “fast start finance”, and to mobilising US \$100 billion per year by 2020 for mitigation and adaptation in developing countries. These values apply to mitigation and adaptation. It may also come “from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance” (UNFCCC 2010a; UNFCCC 2010b).

The Cancún Agreements have not stated, for either mitigation or adaptation, whether the agreed financing of US \$100 billion applies to ‘investments’ or ‘incremental costs’. The AGF report describes the divergent views of its members: some took the view that it should be calculated on the basis of incremental costs as grant equivalents and others did not. The focus on incremental costs stems from language in the UNFCCC agreed in 1992. Article 4.3 of the Convention states that Annex II Parties (developed countries, but not including countries with economies in transition) shall provide new and additional financial resources to developing countries, to meet the “agreed full incremental costs” of implementing measures they may take to meet mitigation related commitments under the Convention. However, this language is viewed as ambiguous and its exact meaning has been a source of debate in UNFCCC finance discussions for over a decade. This may explain the difference in views in the AGF.

The *current* climate-relevant financial flows, from developed countries to developing countries, are significant (see Table 2). A considerable amount of mitigation and adaptation related financing already flows through existing development institutions. Multilateral development banks (MDBs) and bilateral financial institutions (BFIs)

provided a total flow of climate-relevant development support (loans and grants) of approximately US \$20 billion in 2009. Most of this is attributed to the investment costs of low-carbon and climate resilient projects and a smaller amount exclusively to additional costs.

An annual average of US \$10 billion was promised over the years 2010 to 2012 by developed countries, to provide 'fast start' finance for implementing mitigation and adaptation activities in developing countries. In 2010, approximately US \$10 billion were reported by individual countries as fast-start financing, both as grants and loans. This financing was largely provided within the framework of Official Development Assistance, using the established bilateral and multilateral channels. There is a heated discussion on what proportion of these pledges is "new and additional" and what "new and additional" actually means. Estimates range from 0% to 100% (Climate Funds Update 2010; Project Catalyst 2010b).

In addition, funding is available for investment in the carbon market through the clean development mechanism (CDM) and activities covered by voluntary carbon market standards. The *value* of CDM credits issued in 2010 is approximately US \$5 billion and the total *investment* triggered by CDM projects registered in 2010 is approximately US \$23 billion (UNEP Risoe Centre 2010).

Finally, support is provided for adaptation investment and capacity building through bilateral and multilateral institutions of approximately US \$4 to 5 billion in 2009.

Independent of the definition of climate financing, the international community will need to mobilise significant additional financing to provide what is necessary for a 2°C stabilisation pathway.

		Support provided to developing countries (US\$ billion p.a. in 2009/2010)		Needs for a 2°C pathway in developing countries (US\$ billion p.a. in 2020)
Mitigation	Total investments	Support by multilateral institutions as loans and grants	2-9	300 - 600
		Support by bilateral institutions as loans and grants	9	
		Total investments of CDM projects	23	
	Incremental costs	Support by multilateral institutions as grant equivalents	n.a.	50 - 130
		Support by bilateral institutions as grant equivalents	n.a.	
		Value of CDM credits issued in 2010	5	
Adaptation		Support by multilateral institutions	0.5	10 - 250
		Support by bilateral institutions	4	

Table 2: Overview of climate financing support provided to developing countries, compared to the needs in 2020 (sources: Atteridge et al. 2009; UNEP 2009; UNEP Risoe Centre 2010; World Bank 2010, see also Table 1)

2.3 Financial architecture to support developing countries

Any financial flows that are made available to meet mitigation and adaptation needs, eventually must be collected, managed and disbursed to individual projects or programs for mitigation and adaptation. The collective structure of institutions through which this takes place can be referred to as the ‘financial architecture’.

The characteristics of the financial architecture are important because it defines who controls financial flows. The control mechanisms themselves also have a large impact on the willingness of countries to pledge and deliver funding and also on the effectiveness and efficiency with which these resources can be disbursed.

The current financial architecture can be typified as decentralised (see Figure 5). A mix of bilateral and multilateral channels, largely within the framework of Official Development Assistance (ODA), delivers public funding for climate change mitigation and adaptation in the developing world. National governments allocate money through these bilateral or multilateral channels to a range of different recipients and for a range of different objectives. There is limited coordination and no central fund structure to collect and allocate substantial amounts of climate financing. Only a small amount of money is collected and disbursed centrally through UNFCCC funds.

With the decentralised system having gained momentum and the topic of a centralised, international climate change fund to handle all financial flows off the

agenda of the international negotiations, it is likely that a decentralised system will continue to provide the basis of international public climate financing.

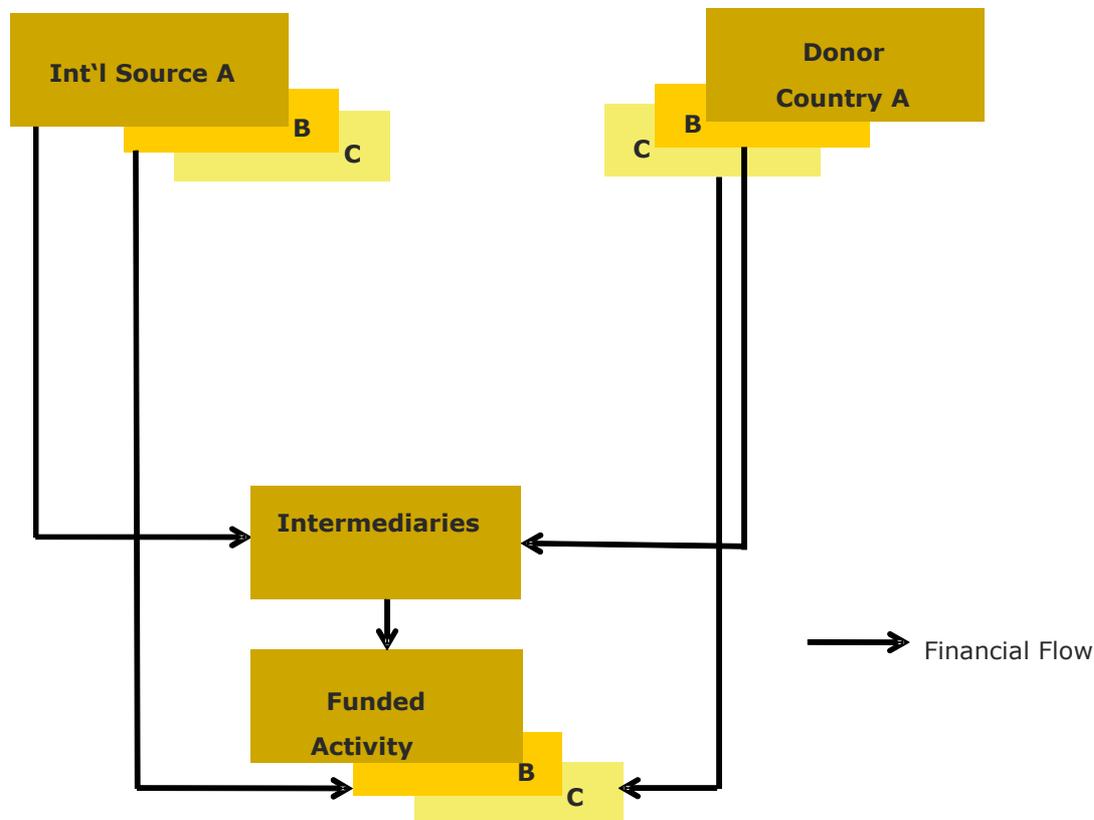


Figure 5: The decentralised climate financing architecture

The Cancún Agreements have added two elements to this structure. Firstly, it has established a Green Climate Fund as an operating entity of the financial mechanism of the Climate Convention. This important new UNFCCC intermediary will, with a priority on adaptation, channel climate change financing to support projects, programmes, policies and other activities in developing countries. Many countries expect to channel a significant amount of climate change financing through this fund, especially that for adaptation. Other entities that channel climate change financing will operate in parallel.

The Cancún Agreements also agreed on the establishment of a so-called registry. In a decentralised structure without a registry it is difficult to coordinate flows and monitor overall availability of and need for mitigation and adaptation financing. Furthermore, it is difficult to assess whether activities are sufficient for a 2°C stabilisation pathway. A well-designed registry can support the matching of recipient and donor. It would collect information to facilitate the linking of developing country needs to available financing from appropriate sources. It would provide an overview of the existing financial flows and would therefore allow for assessment and a change in priorities if

necessary. Figure 6 illustrates how the registry would be incorporated into the decentralised approach.

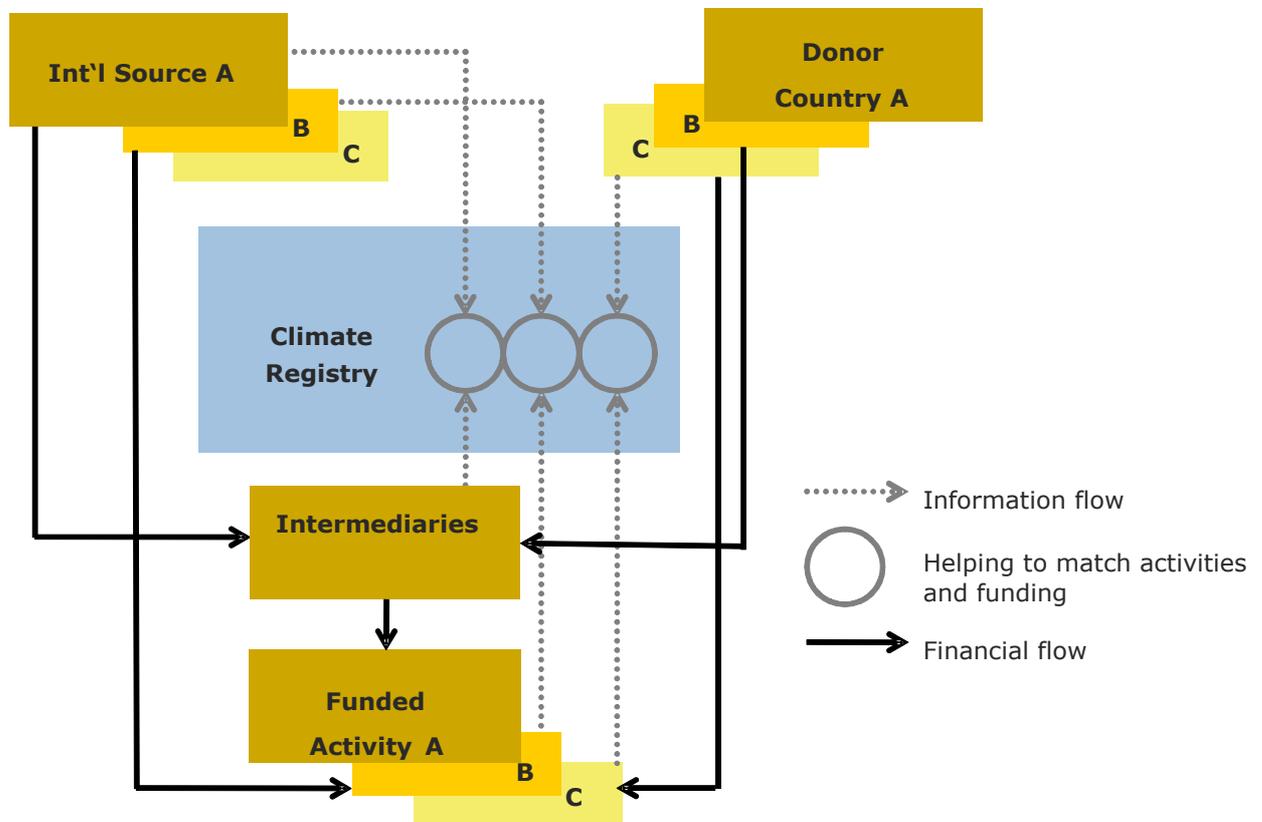


Figure 6: The decentralised financial architecture and the concept of a registry (Ecofys based on Reed 2009; Müller 2010)

This Climate Registry could provide the additional coordination that the decentralised system currently lacks. Donors of financing remain in control of how it is spent, but are encouraged to adapt their priorities if the global picture in the registry exhibits gaps and/or overlaps.

3 Sources of revenues

A significant part of the discussion on climate change financing is that regarding sources of funding for climate change mitigation. The AGF was commissioned to assess possible sources.

This chapter summarises the findings of the AGF report, focusing primarily on the practicability of the sourcing options. It will also examine any relevant responses to the report since its publication.

In the interest of conciseness, this paper has aggregated the AGF-report categories into five main categories of potential sources for climate change financing. Table 3 provides an overview of the AGF categories and the categories used in this paper.

Categories used by AGF	Categories used in this paper
International transport	New taxes
Financial transaction revenues	New taxes
Carbon-related revenues	New taxes/auction revenues ²
Carbon market public revenues	Auction revenues
Direct budget contributions	National budgets
MDB contributions	Public debt instruments ³
Carbon market offsets	Carbon market offsets
Private capital	Private capital

Table 3: Matching table for categories of sources

3.1 New taxes

The first potential source for climate change financing assessed by the AGF report is the introduction of new taxes. These can be directly related to carbon intensive activities ('carbon taxes'), but can also be applied to other activities or money flows that do not have a direct link with carbon emissions. It mentions specifically taxes on international transport, on financial transaction and on carbon market transactions.

In terms of practicability, the AGF report sees political acceptability as the main potential obstacle. National taxes are politically difficult to introduce as voters do not generally approve of national resources being used for international purposes⁴. In

² In the AGF report, the 'Carbon-Related Revenues' category cover taxes as well as auction revenues.

³ The AGF report refers to using the government-backed high credit rating of development banks as an instrument to raise revenues. We therefore discuss this option as using public debt instruments.

⁴ This is known as the 'domestic revenue problem'

addition to this, nationally introduced taxes are likely to cause competitive distortions⁵ and hamper economic development in both developed and developing countries. For these reasons, a widely applicable international tax would be most appropriate. However, such taxes are difficult to agree upon because of the perceived political importance of tax sovereignty.

3.2 Auction revenues

Auctioning of carbon allowances as part of emission trading schemes is a carbon efficient way of raising revenues, as the revenue is directly linked to the emission of carbon. Obviously, this source of financing is strongly dependent on the extent to which trading schemes will be applied in the future, the level of carbon prices and the level to which the raised auction revenues are allocated to climate change financing. As with taxes, voters do not like national resources being allocated to international destinations. These factors make it an unpredictable source.

An international carbon auction would improve the reliability of the source, but require agreement in an international forum. This has proven to be difficult. Even at the EU level, a single, central auction is politically unfeasible.

However, generally, the practicability of auction revenues as a source has been demonstrated: it is currently the only source of 'new climate finance' that has actually delivered financing climate change activities in developing countries (in addition to the indirect contribution of carbon taxes, which may have been financing Norway's contribution to REDD, for example).

3.3 National budgets

Allocating resources directly to climate change in a national budget is a straightforward way for national governments to finance climate change mitigation and adaptation. Direct budget contributions have been an important source of climate change financing until now. However, with the recent deterioration of public financial health in many developed countries, it has become more difficult for national governments to make public finances available. At a time when governments are generally decreasing public spending, it is often politically difficult to increase spending on international climate change without binding international agreements.

An additional source could be tapped by adapting the use of current domestic and international public flows. Currently, the non-climate related, conventional government support systems that are in place are not specifically designed to stimulate climate-friendly activities. These support mechanisms can be improved by introducing a set of conditions to ensure that they support climate-positive or at least climate-neutral activities, while still achieving their original objectives. This will

⁵ These can be partly neutralised with border adjustment taxes.

provide a boost to climate mitigation, not by creating additional public financing flows, but by re-directing already existing public flows.

An area that requires attention is fossil fuel subsidies. These are still widely applied in developing and developed countries. Examples include subsidies for coal mining and keeping the prices of petrol or gas artificially low. The total of these subsidies were estimated to be US \$312 billion in 2009 (IEA 2010). By lowering the price of conventional technologies, this financing flow directly counteracts the effects of climate financing. It is therefore paramount that these existing subsidies for fossil fuels must be phased out as soon as is possible in a socially responsible way. This would have the double effect of freeing up resources and decreasing the costs difference between conventional and low-carbon investments.

This could also apply to the support of export with public guarantees or current flow of Official Development Aid (ODA) if poverty alleviation is not negatively affected. Ensuring that ODA is only used for *sustainable* development can make a significant contribution to mitigation. As much as 40% of ODA is considered to be 'climate-sensitive'⁶. This means that the way that this money is spent influences adaptation and mitigation levels.

3.4 Public debt instruments

Public debt instruments raise money for public entities by borrowing from bond markets. Most developed country governments can borrow money at a discount because their chance of default was considered low compared to privately held companies.

Development Banks use the same principle for raising capital. Using their good credit rating, which is based on the fact that they are backed by developed country governments, they borrow money at favourable conditions. This way, they can afford to lend at a lower interest rate or accept higher risk, a benefit that they can pass on to their clients in the interest of development and climate protection.

Obviously these debts must be repaid as for commercial loans. Loans inevitably will make the most significant contribution to the 'investment' side of financing needs. With their effect of lowering the cost of capital, they can also have a significant 'grant equivalent' effect at relatively little net cost to the public.

By assuming the use of public debt instruments without specifically discussing their practicability, the AGF report implies that they are a reliable and practical way to raise financing. The focus of the AGF report is on the difficulty of agreeing on the management and distribution of the raised capital. These difficulties will be discussed in a later section of this paper.

⁶ World Bank, Clean Energy and Development: Towards an Investment Framework.

3.5 Carbon market offsets

By allowing participants in emission trading schemes to offset their carbon emissions by reducing emissions in developing countries, a flow of financing is created that benefits developing countries and allows them to develop low-carbon technologies. The best-known example of such an offset scheme is the Clean Development Mechanism (CDM) established under the Kyoto Protocol.

Offset schemes will only have a significant effect if the carbon price is sufficiently high and stable. This requires strong and consistent demand, which means that developed countries must set ambitious long-term caps for their greenhouse gas emissions. Current targets under the Cancún Agreements for 2020 do not create this demand (Chen et al. 2011; UNEP 2010).

On the positive side, several national and regional governments are developing their own new offset mechanisms. New domestic and regional emissions trading schemes e.g. California and the Western Climate Initiative in the USA or bilateral schemes as proposed by Japan may add new demand for international offsets to the current level of demand from the existing compliance markets. However, it may be the case that such bilateral demand is not additional to the demand under the Cancun Agreements. For example, Japan may wish to fulfil its 25% reduction target with some of these new bilateral credits. It is therefore unlikely that such demand will be of the scale necessary for a 2°C pathway.

Another requirement is the implementation of clearly regulated carbon market mechanisms. The future of CDM, the most important existing mechanism for developing country support, is insecure due to the uncertainty around the Kyoto Protocol. The introduction of additional international mechanisms under the UNFCCC is being discussed, but it will take years until they would be operational. Although the CDM is generally accepted as a mechanism, there is resistance from some developing countries to develop new international market mechanisms. In the absence of internationally coordinated mechanisms, bilateral mechanisms are under development which will create some overlap in methodologies and therefore inefficiencies.

Finally, the AGF mentions that offset mechanisms are only likely to stimulate financing of abatement activities in sectors with large single point emission sources, such as the industrial and the power sector. Because of the required monitoring of specific reduction achievements and despite new methodologies like Programs of Activities, it is still difficult for current carbon markets to include mitigation activities that cannot be linked to a single source or entity. In addition, significant capacity is required in developing countries to operate new carbon market mechanisms.

The authors of this report see, in the light of the recent developments, relatively low prospects for significant increases in climate financing through the carbon markets in the near future, contrary to the AGF report. It can potentially have a significant impact, but only if reduction targets of developed countries are strengthened, new

international rules are set expeditiously and significant additional capacity building efforts are initiated.

3.6 Private capital

To progress along a 2°C stabilisation pathway, a shift of private investment flows from high-carbon to low-carbon activities will need to take place. Hopefully, existing and expected regulatory and public pressure on investors to move away from carbon-intensive activities is already causing a shift towards low-carbon activities. Overall however, the AGF report justly notes that private capital will not automatically pay incremental costs, if low-carbon investments are less profitable than investments in conventional assets. Public financing (in addition to other public interventions that improve the investment risk environment) must be used efficiently to change the conditions so that there is no perceived additional cost to the low carbon investments over the conventional investment. This can be achieved through financial support at project level and also through improving high-level policies to improve investment conditions.

This paper focuses on mitigation activities, but it should be noted that attracting private investments for adaptation activities is possibly even more difficult. Most adaptation activities are related to public assets and services, such as flood defences. In these cases, adaptation projects will find it difficult to generate any cash flow and will therefore have difficulty finding private financing.

3.7 Conclusions

There is a range of ways to mobilise public funding for climate change. However, national and international political reality makes it difficult to generate these public financial flows for climate change purposes. This is illustrated by the fact that so far the only realised additional source has been through auction revenues and, indirectly, through a carbon tax. Using public guarantees and risk compensation for concessional loans provided by multilateral and bilateral development finance institutions has the effect of lowering the cost of capital which has a significant 'grant equivalent' effect. Most incremental costs will probably need to be covered by public sources, such as taxes, carbon auctions and national budgets or private sources through carbon markets or regulation. Alternatively also legislation or mandatory standards can force the private sector to bear additional costs of green investments.

Because international coordination is cumbersome, generation of such public sources are likely to begin as domestic measures, and can only become internationally coordinated if and when international policy structures become more stable and binding.

The potentially high costs for adaptation activities will largely rely on public financing, so that the often poor population groups in developing countries can be supported to adapt. This will further limit the resources available for mitigation activities and will

increase the need to leverage private capital for mitigation. From the AGF report, we can see that the concept of using public finance to attract even greater private finance finds increasing acceptance by the international community.

Provided that climate is a key policy priority an important instrument for mitigation could be to ensure that the existing infrastructure financing is preferably stimulating low-carbon development. E.g. the carbon-intensity of a project could be one criterion for the allocation of concessional financing. First and foremost, subsidies for fossil fuels should be phased out as soon as possible, in a socially responsible way. These subsidies are estimated to have amounted to about US \$312 billion in 2009 (IEA 2010).

4 Instruments

One of the conclusions of section 3 is that public resources must be used with care to leverage and to channel private investments for mitigation. When using the appropriate instruments, the required mitigation activities can be financed with a minimum amount of public resources.

There is a range of financial instruments that can be used to achieve this. The AGF report itself looks at some of these instruments in more detail from a perspective of raising private revenue. The AGF report findings will be taken into consideration in this section. As a conclusion, it recommends that further work should be done on finding the most effective use of the available funding for climate actions. In accordance with this, the available instruments will be given a closer examination in this section.

The following instruments will be discussed:

- Grants
- Guarantees & insurance
- Concessional loans
- Equity
- Policy improvement

4.1 Grants

Grants are used for many purposes. Grants are often used for capacity building at national level. For this purely public activity, which generates no direct returns, private investors usually only come in at a later stage, e.g. after a grant supported feasibility study. Grants are also used to support technological development in the early stages, where the risks of the loss of investments are high, but the amount of finance required is relatively small. This makes it possible to use grants for this purpose, while in later stages of development the investments become too large to be funded by grants alone. The term 'grant' suggests that the funding is a gift. However, grants are never provided without comprehensive associated conditions.

4.2 Guarantees & insurance

Guarantees and insurance are used to share the risks of activities. A guarantee is an obligation to compensate a lender in case a specific borrowing party defaults on a loan. Governments or development banks can provide guarantees against below-market fees. This instrument is appropriate when elevated risk perceptions impede the flow of finance to activities with a public value and potential for long-term development. A publicly supported guarantee reduces private risk and increases investment to the levels desirable for society.

This situation often occurs when a technology has been proven, and is ready to be introduced to the market place. At this stage, some cash flow can be generated and

therefore private lenders are in principle interested in providing loans. However, often the risk is still not within a level of control that will convince them without additional public guarantees.

In addition to reducing the risk of a private investor, the provision of a public guarantee can also lower the overall risk of an activity. An important element of risk is often regulatory risk, which means that the host government has an important influence on the success of a project. The public institutions that provide the guarantees, and thereby gain an interest in the success of the project, often have a measure of influence on these governments through political ties or credit lines. This will make it less likely that regulatory changes will be implemented that adversely affect the guaranteed projects.

The grant-equivalent that this instrument provides is in the risk that the issuer of the grant takes, without coverage of (sufficient) fees to not make an expected loss on this activity in the long-term.

Insurance is a similar instrument. In the scaling-up phase of mitigation activities, lack of available insurance products in developing countries can be a barrier. Commercial project developers like to insure themselves against certain risks, such as business interruptions or technical failure. These products are often not available in the sectors and countries where these activities could be deployed and scaled up. Public resources can be used to provide these insurance products where private insurers do not. This will not only allow private investors to move into these markets, but also makes it more likely that insurance products will be offered in the future based on the experience gained by public pioneering.

Similar to guarantees and loans, the grant-equivalent provided in this instrument is in the discount on the commercial fees that would be charged by a commercial provider, or in the unquantifiable risk that is taken onto the balance sheet and is expected to result in a loss in the long term.

4.3 Concessional loans

Concessional loans (or 'soft loans') are loans with lower interest rates and/or with lenient servicing conditions. This is another tool that can help project developers to bridge the financial gap between the demonstration phase and commercial maturity, when they can obtain private financing.

Concessional loans are an efficient tool in all sectors in which investments generate stable cash-flows. They commit private project partners to paying back the loan from the profits of the project which makes it more likely that the partners will adopt a business-like attitude and operate efficiently. Because lending means that it is expected that the money will eventually be paid back, it also allows public institutions to 'recycle' the funds, and use them again for stimulating climate friendly activities.

The grant-equivalent of concessional loans is the cumulated difference between the interest charged for it and the interest that would be charged by a commercial bank. This calculation is not always possible, as some loans are not provided by commercial banks because they cannot quantify the risks involved and therefore cannot calculate a commercially appropriate interest rate.

4.4 Public equity

High-risk projects can benefit from a public partner who takes a (subordinated) equity stake in a project or company, providing investment capital. This makes investing in such a venture more attractive for potential private equity partners. This is not only because of the lower financial risk that a subordinated equity partner provides, but also because the public partner often provides a network, relevant knowledge and most importantly, influential connections that it can use to ensure good quality policy that benefits the sponsored activities.

If chosen with business acumen, buying equity can be a good use of public resources. It will stimulate activities that are expected to deliver a long-term public benefit and also reap some of the potential private profit, which can subsequently be recycled.

It is difficult to assess whether this instrument represents a grant-equivalent. This is because the reason that private investors do not take equity shares in these activities is the fact that the size of the potential loss and/or the risk this loss will incur is not quantifiable. This could mean that in the long-term, buying equity can result in a profit for the public investor and therefore this instrument does not represent a grant-equivalent. However, these types of investments might also result in an entire loss of an investment, giving it a strong grant-equivalent character.

4.5 National policy

At any stage of the development of climate mitigation activities, stable and appropriate policy is paramount to attract private finance to a region or sector. Policy improvement is therefore the basis of any comprehensive strategy to attract long-term climate finance. By financing technical support with concessional loans or grants, international climate finance can help countries set up the right policy environment for stimulating climate friendly investments. However, the most important prerequisite for developing the appropriate policy is strong and broad political support in the host country itself.

4.6 Overall application of instruments throughout activity development

Figure 7 below provides an overview of the application of the instruments throughout the development of climate change activities towards commercial maturity, as described above. In general, a mix of instruments must be found to share the costs

and risks of projects and programmes between the public and private sector in industrialised and developing countries.

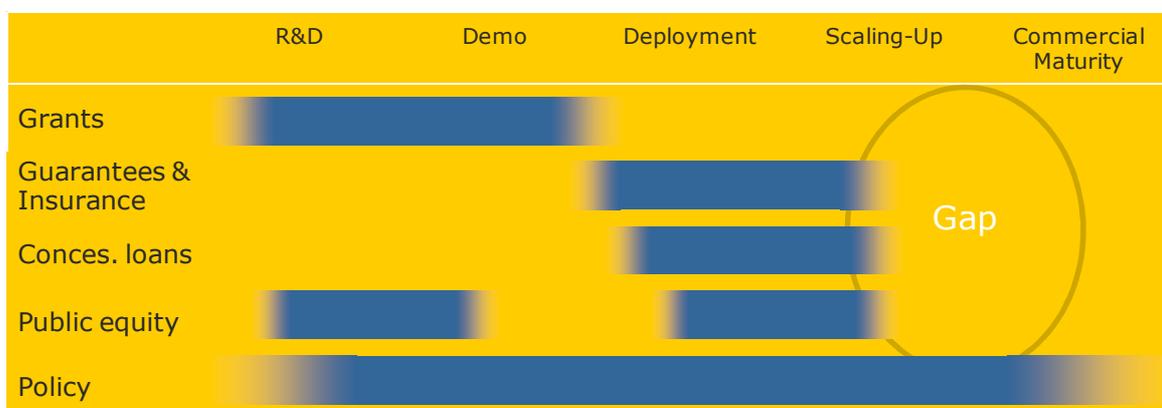


Figure 7: Application of instruments in phases of activity development

This figure illustrates that each instrument plays a role in a particular phase of the development of climate change mitigation activities. The appropriateness of the instrument depends on the stage of development of the activity and the host country. It also illustrates that good policy is necessary at every stage of development. At every step, some kind of commercial financing can be attracted.

All the instruments mentioned must be applied in a way that ensures that the provided support attracts private capital and also avoids excessive profits by private investors. Getting this balance right is a complicated and specialist task. Fortunately, as these instruments have been applied in development aid for a number of years, there is considerable experience in their application.

A general observation from the figure is that there is a gap in the scaling-up phase of activities. The scaling-up phase is important as it is at this point that producers undergo the 'learning curve'. This means that every additional unit is produced at a lower price than the one before because producers learn by doing and can start to take advantage of economies of scale. This will eventually make it possible for low-carbon solutions to compete with conventional ones without public support.

At this stage, much larger amounts of capital are required. At the same time however, many technologies are still not competitive and have a large technology risk still associated with them. Public resources are often insufficient to provide the scale of support that is necessary to carry the incremental costs associated with these risks. This is where the challenge of meeting mitigation targets lies.

In some cases, it may be considered to provide grants for technical support in this phase as well. This will help producers deal with the practical problems they discover in the expansion of their activities. Providing grants for technical support will mean

that budget for R&D will be spent on practical problems that have a direct effect on the levels of mitigation.

When an activity is scaled up, the pressure on public resources is also scaled up. Fortunately, this effect is mitigated by the fact that as activities move towards commercial maturity, the share of grant-equivalent contributions packaged in the instruments becomes smaller. In the scaling-up phase, the share of public support will decrease, and leverage relatively more private resources.

Finally, policy support is important in every phase. Intelligent policies can catalyse large scale reduction with relatively small public investment.

5 Overall conclusions

To maintain on a 2°C stabilisation path, increased investments of trillions of dollars must be made. The objective of 'climate finance' is to help to achieve this. The scale of public funds used and the means to disburse them must be appropriate for this immense task.

Although the estimates of the need for public and private climate change financing vary widely, even the most conservative estimates suggest that there is a large gap to be bridged by additional sources of financing. The AGF report shows that it will be difficult to find these additional sources. Public debt instruments that lower the cost of capital have a significant 'grant equivalent'. Carbon offset can contribute, but the carbon market cannot be relied upon to provide most of the financing in the near future. The initial focus for public funds from developed countries will be on adaptation in developing countries.

The challenge therefore, is the most efficient use of the scarce remaining public resources to achieve the necessary mitigation. Ultimately, the total level of mitigation catalysed through public financing is more important than the level of public financing itself.

The effect of public funding can be greater if it more efficiently and effectively re-directs private financing. A number of instruments are available, ranging from grants to concessional loans and equity. In general, all these instruments are appropriate in specific circumstances. Which one is most effective and efficient depends on the particularities of a specific project or activity. Making the right choice requires specialised knowledge and experience. Existing knowledge within financial institutions should therefore be used and expanded. Appropriate policy in the host countries is a basic condition to convince private investors. Existing public support mechanisms should also be climate-proofed and fossil fuel subsidies should be abolished in a social manner to help the shift to a low-carbon economy.

Currently, the most important challenge is to find instruments that allow scaling-up of mitigation activities. This is a difficult stage in the development of mitigation activities to commercial maturity because technologies are often not entirely proven and large sums of investment are required. Private investment is particularly important and also viable in this phase: important because operational efficiency and market knowledge are needed to successfully roll out new technologies, viable because the activities are relatively competitive with conventional technologies.

Through this period of learning, ambitious front runners are necessary to proactively demonstrate the positive effects of mitigation and adaptation activities undertaken by developing countries with developed country support. To maintain the 2°C stabilisation pathway, global carbon emissions must have reached their peak before 2020. Considering the fact that any carbon-intensive investments made today will have an

impact for over 30 years, the global community must take decisive action now. This requires scaling up current activities in parallel to building new institutions and processes.

For short-term progress, starting in 2011, we recommend the following paths of action to the stakeholders in the international community of climate change financing:

- Build on the new pragmatism demonstrated in Cancún and move quickly
- Develop consistent definitions of climate financing flows, investments and incremental costs and use them to derive comparable information on current flows and needs
- Mobilise additional and redirect existing public resources for efficient and effective mitigation and adaptation on a 2°C stabilisation pathway
- Use limited public resources efficiently as well as carbon markets in order to leverage private sector green investments
- Use a mix of financial support instruments to share costs and risks of projects and programmes between public and private sector in industrialised and developing countries
- Build on existing experience, coordinate existing and new implementation channels

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