Background Report on Long-term Climate Finance

prepared for the German G7 Presidency 2015
by CICERO and Climate Policy Initiative

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

G7 GERMANY 2015

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

PREPARED BY CICERO AND CLIMATE POLICY INITIATIVE

CICERO

CICERO helps to solve the climate problem and strengthen international climate cooperation by predicting and responding to society's climate challenges through research and dissemination of a high international standard. CICERO researchers collaborate with top researchers from around the world, and publish their work in recognized international journals, reports, books and periodicals. CICERO has garnered particular attention for its research on the effects of manmade emissions on the climate, society's response to climate change, and the formulation of international agreements. CICERO has played an active role in the IPCC since 1995. In recent years CICERO has also developed considerable expertise in climate financing.

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Climate Policy Initiative

Climate Policy Initiative (CPI) works to improve the most important energy and land use policies around the world, with a particular focus on finance. It supports decision makers through in-depth analysis on what works and what does not.

CPI works in places that provide the most potential for policy impact, including Brazil, China, Europe, India, Indonesia, and the United States.

Its work helps nations grow while addressing increasingly scarce resources and climate risk. This is a complex challenge in which policy plays a crucial role.

CLIMATE POLICY INITIATIVE

ACKNOWLEDGEMENTS

CICERO and Climate Policy Initiative (CPI) prepared this Background Report on Long-term Climate Finance for the German G7 Presidency 2015.

The authors highly appreciate the advice, comments, and information received from a group of experts in the process of producing this report. The members of this group were Pascal Canfin, Jan Corfee-Morlot, Jane Olga Ebinger, João Carlos Ferraz, Tom Heller, Boqiang Lin, Kjetil Lund, Stephan Opitz, Teresa Ribera. The presentation of information and views set out in this report reflects the scope of report as interpreted by the authors and do not necessarily reflect the opinions of the members of the group of experts.

CONTENT

CONCLUSIONS

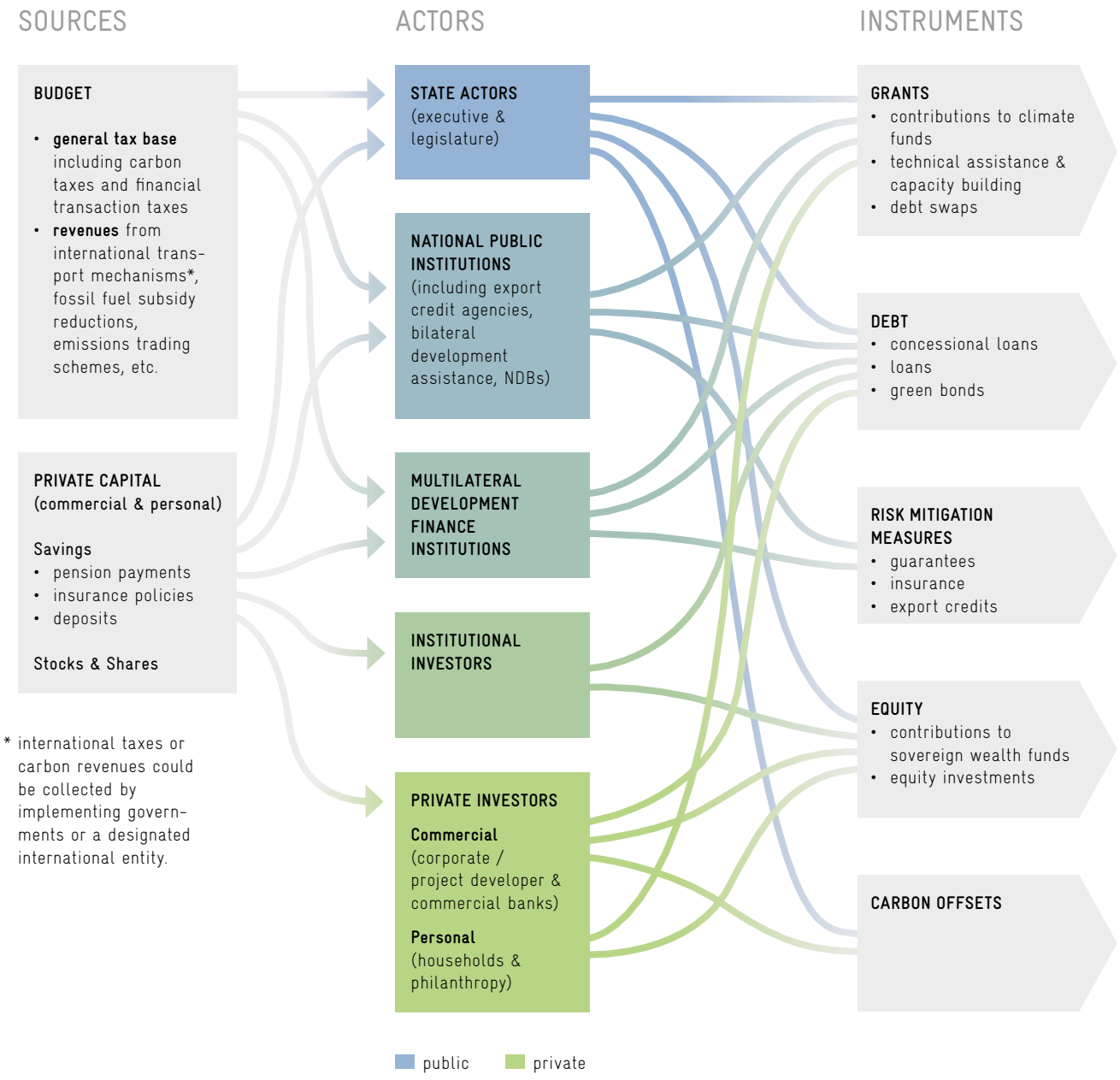
1. **If combating climate change was already perceived as an enormous challenge in Copenhagen, it is even truer six years later**. Observed impacts on local and global climate have increased and the accuracy of forecasts and analysis on climate change effects have improved. Recent estimates of global investment needs to reduce emissions to levels consistent with a 2 degree Celsius temperature rise are in the trillions of USD from now until 2050.

2. **A transformation of the global economy from a high-carbon, high climate risk system to a low-carbon and climate resilient one requires the redirection of trillions of dollars of public and private finance**. The commitment made by developed countries in Copenhagen in 2009 to jointly mobilize USD 100 billion a year by 2020, in the context of meaningful mitigation action and transparency on implementation, to address the needs developing countries is a step in unlocking the finance required to make this transition. Achieving this transition requires the full range of public, private, international and domestic financial resources – in the range of trillions of dollars – to be mobilized globally.

3. **Important opportunities have emerged to redirect resources away from high-carbon, high climate risk investments to low-carbon and more resilient alternatives**. Renewable energy costs have continued to fall, making some renewable technologies price-competitive with fossil fuel generation. Oil prices too have dropped dramatically in the past year making fossil fuel sources less expensive. This could slow down low-carbon transition. However, it could reduce the costs of transitioning away from oil and present a once-in-a-generation opportunity to level the playing field by eliminating fossil fuel subsidies at lower cost to consumers, taking into account possible social impacts.

4. **Experience shows that stable enabling environments that offer business certainty and predictable regulatory and economic frameworks are essential to mobilizing finance at scale.** Investors seek clear and enforceable legal rights and sound fiscal policies to help them balance costs and risks. There are many examples of mitigation policies and targets as well as economic instruments that have sent clear price signals, to successfully unlock low-carbon investments. Consistent policies and incentives, that support climate action on one hand, while reducing motivation for continuing brown or maladaptive investments on the other, are crucial for motivating more low-carbon and climate resilient investments. Adaptation polices lag behind but mainstreaming climate-resilience across development plans and investment portfolios presents multiple opportunities to achieve co-benefits and better value for money.

5. **Since the UN Secretary General High-level Advisory Group on Climate Change Financing released the 'AGF' report in 2010, understanding has improved about the complex interactions between sources** of climate finance, and the roles and decisions of **different actors** who raise and invest climate finance through **a range of policies and instruments** (see the *figure* below).


SOURCES
ACTORS
INSTRUMENTS
BUDGET
• general tax base including carbon taxes and financial transaction taxes
• revenues from international transport mechanisms*, fossil fuel subsidy reductions, emissions trading schemes, etc.
PRIVATE CAPITAL (commercial & personal)
Savings
• pension payments
• insurance policies
• deposits
Stocks & Shares
* international taxes or carbon revenues could be collected by implementing governments or a designated international entity.
STATE ACTORS (executive & legislature)
NATIONAL PUBLIC INSTITUTIONS (including export credit agencies, bilateral development assistance, NDBs)
MULTILATERAL DEVELOPMENT FINANCE INSTITUTIONS
INSTITUTIONAL INVESTORS
PRIVATE INVESTORS
Commercial (corporate / project developer & commercial banks)
Personal (households & philanthropy)
public
private
GRANTS
• contributions to climate funds
• technical assistance & capacity building
• debt swaps
DEBT
• concessional loans
• loans
• green bonds
RISK MITIGATION MEASURES
• guarantees
• insurance
• export credits
EQUITY
• contributions to sovereign wealth funds
• equity investments
CARBON OFFSETS

6. **Governments have a strong toolkit of policies, public institutions and financial instruments that together can drive economic transformation at scale**. Concrete measures are available to support the mobilization of climate finance by reducing the costs and increasing the returns of low-carbon, climate-resilient investments, addressing risks for investors in such projects and closing knowledge gaps. Recent experience and analysis highlight that different measures have different effects on the overarching climate finance system and that there are different avenues to deliver on the commitment to mobilize USD 100 billion a year by 2020 and towards the needed transformation toward a low-emission and climate-resilient development. Getting the mix right is crucial to build a system capable of addressing diverse needs and circumstances.

    a. **There is a distinct role to play for public finance as key driver**. By making catalytic use of public resources, governments can encourage and support the delivery of a low-emission and climate-resilient economy and reduce costs and risks for the necessary investments.

    b. **Public grant finance remains important to support the poorest and particularly vulnerable countries** that cannot attract private investments, and activities which may find it difficult to attract private finance such as some adaptation activities. **Public grant finance plays a catalytic role** by supporting developing countries' efforts to establish the policies, frameworks, and institutional and technical capacity essential to shift public and private investments toward actions that tackle climate risks and build resilience. Nevertheless, effective partnerships with the private sector on adaptation should be pursued.

    c. **Concessional loans by public development finance institutions can reduce financing costs below the commercial rates available in many developing countries and play a catalytic role in triggering climate friendly investments without crowding out private actors.** Loans by public institutions with tenors that match the financing requirements of projects can absorb part of the risks and costs of international adaptation, renewable energy and energy efficiency investments while attracting private expertise, innovation and investment.

    d. **Increasing the availability of risk coverage measures that deal with specific risks associated with developing countries can unlock private investment.** These measures include long-term, low-cost finance where capital markets are incomplete, political risk insurance, export credits, and guarantees where there is real or perceived regulatory uncertainty, and hedging and currency swaps to address foreign exchange risks. The emergence of new green or climate-aligned investment products e.g. non-fossil indices and green bonds can facilitate more proactive climate investor strategies. Limited experience of these newer instruments means they may deserve further attention and additional assessment.

7. **Since the UN Secretary General High-level Advisory Group on Climate Change Financing (AGF) in 2010 global climate finance flows have increased.** The sources, actors and instruments identified are showing varying performance compared to the AGF's projections. The most crucial assumption of the AGF – that there would be a global carbon price of USD 20–25 per tonne of CO_2 in 2020 – is unlikely to materialize, negatively impacting the potential of other carbon based sources of finance to play a significant role in meeting the USD 100 billion commitment a year by 2020.

    a. **Some developed countries have introduced carbon markets and taxes but have not directly allocated significant amounts of the revenues generated for international climate finance.** Where revenues have been generated, realised amounts have been far below those expected due to low carbon prices. Potential remains for such measures to generate additional revenues.

    b. **Some sources and instruments (**international aviation and shipping mechanisms and regional or global financial transaction taxes) **require a significant degree of international cooperation** to be implemented at scale. Progress has been mixed so far**.**

    c. **Public budgets have been a reliable, transparent and growing source of international climate finance**, even though some countries have faced considerable financial pressure and political opposition to dedicating resources to international climate action.

    d. **Public institutions such as bilateral agencies, bilateral development financial institutions (DFIs), and multilateral development banks (MDBs) play a pivotal role channelling and mobilizing resources, and are outperforming the AGF's expectations.** DFIs and MDBs in particular can leverage capital from markets and mobilize additional resources for developing countries. The governments that are shareholders of agencies, DFIs and MDBs and members of their governing bodies, can give guidance how to best use the toolbox at hand, including by mandating climate considerations be mainstreamed across all activities.

    e. **In global terms, private capital is the largest source of climate investment flows, but the full potential is still not realized as new financial systems and products to address credit, financial and liquidity risks still require improvement.** There are no precise quantitative estimates of global private flows that help address climate change. There is also no clear picture about how much private climate finance is currently being mobilized by developed country governments toward the USD 100 billion commitment, due to a lack of shared understanding about what constitutes mobilized private finance and difficulties to track it. There are a number of initiatives, however, that are working to better understand the connection between public and mobilized private finance.

8. **This paper takes no position on what should count towards the USD 100 billion commitment and what should not, nor does it add up flows to count toward this figure.** Rather it provides an update on the tool kit of sources, actors and instruments using the latest available information, to help governments strengthen their efforts. A range of estimates are possible on the progress which developed countries haven made toward mobilizing USD 100 billion a year by 2020. However, definitional, methodological and data gaps remain. Therefore, work is needed to gather and track data, in particular on private flows mobilized by public finance or interventions.

9. **Strong political will is crucial to fulfilling the USD 100 billion commitment to support developing countries' transition to low-carbon and climate-resilient economies and spend it in a catalytic way in order to have the most impact on mitigation and adaptation efforts**. It has become clear that public budgets and public interventions play a pivotal role in domestic and international contexts, including in driving private investment. This means that governments have an opportunity to use their resources catalytically. Concrete steps to scale up, strengthen and optimize the mobilization of climate finance are being identified by developed country governments, and there is room for more work on this. This could include scaling up public climate finance, delivering stronger guidance and mandates to agencies, DFIs, and MDBs to focus more on mobilizing private finance, and mainstreaming climate considerations into their general operations. Private and institutional investors show positive signals and more appetite for low-carbon and climate resilient investments, and welcome clearer signals from governments. A better understanding is needed regarding how public and private interests can be aligned to most effectively mobilize finance for climate investments, and how effective policies and instruments are in balancing risks and returns of climate investments.

10. **Globally, climate-resilient, low-carbon growth requires a massive shift of capital away from a high, toward a low-carbon economy**, e.g. infrastructure requirements for a high-carbon economy, across transport, energy, water systems and cities, are estimated at an average of USD 6 trillion per year over the next 15 years. Aligning policies, pricing signals, and financial instruments to encourage the shift toward a low-carbon economy could reduce the up-front cost of low-carbon infrastructure to, less than 5 % more than business-as-usual. Moreover, these up-front costs could potentially be fully offset by the lower operating costs of low-carbon, climate-resilient infrastructure. Significant coordination and strong leadership is essential to align policies, pricing signals, and financial instruments to steer financial flows towards a low carbon and climate resilient future.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Coca-Cola

1. Introduction

A major investment shift toward low-carbon and climate-resilient infrastructure and away from high emitting activities is required to support the economic transition necessary to reduce emissions in line with the internationally agreed goal to limit global temperature rise to 2° Celsius. The scale of finance required means that solutions must include multiple sources of climate finance via a sometimes complex combination of public and private sources, actors and instruments.

This Background Report on Long-Term Climate Finance was prepared for the German G7 Presidency 2015 to serve two objectives; 1) to describe recent trends that could impact global climate finance flows; and 2) to provide an updated overview of sources, actors and instruments relevant for achieving the commitment to mobilise USD 100 billion goal per annum for developing countries' climate actions by 2020. The trends and updates presented in this report aim to facilitate serious discussion between political leaders on the key questions relating to long-term climate finance.

Section 2 describes recent global trends that may impact flows of climate finance. Section 3 presents the current state-of-play for the sources, actors and instruments of climate finance that are likely to play a role in meeting the USD 100 billion commitment.

‹ Lagos downtown market streets, Nigeria

Defining climate finance

While there is no internationally agreed definition of climate finance, this report adopts an inclusive working definition to capture information about public or private financial investments that specifically target low-carbon or climate-resilient development. This definition is similar with the definition used in Climate Policy Initiative's Global Landscape of Climate Finance reports (Buchner et al., 2011a), and includes all financial flows that support climate action without limiting what types of flows may be considered 'climate finance'. 'Long-term financing' is meant to signal climate finance in 2020 and beyond. This broad definition aims to ensure the report captures the most complete picture possible of international progress toward meeting the total projected investment needs of a global low-carbon transition, particularly in Section 2.

Definitional challenges remain with regards to distinguishing whether some sources of climate finance are either public or private, as well as what constitute 'mobilised' climate finance flows. Determining answers to either of these questions is beyond the scope of this report.

The USD 100 billion commitment

Developed countries' commitment to the goal of mobilising USD 100 billion per year by 2020 from public and private including alternative sources is a basis for considering possible sources of finance for climate mitigation and adaptation in developing countries, and provides the framing for Section 3 of the report. The USD 100 billion goal was made at the height of the global recession in 2009 during the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) in Copenhagen. It is a significant political commitment and represents a large amount of climate finance, but it must be noted that the investments needed to transition to a low-carbon economy are much higher. The commitment is to be met through joint efforts by developed countries to mobilise finance to help address the climate-specific investment needs of developing countries, and to drive transparent implementation of meaningful mitigation and adaptation actions.

This report does not attempt to inform the political discussion on how different sources should be counted towards the USD 100 billion goal. Rather, it aims to provide decision makers with an indication of which financial sources, actors and instruments have most potential to be optimised and targeted to meet investor needs, to unlock new climate finance flows through to 2020 and beyond.

Previous climate finance reports: The AGF Report and the G20 follow-up study

In 2010, United Nations Secretary General Ban Ki-Moon convened the leader-level High Level Advisory Group on Climate Change Financing (AGF). He invited representatives from a range of developed and developing countries to explore potential sources of finance to meet the USD 100 billion goal. The report (AGF, 2010) found that it was 'challenging, but feasible' to achieve the goal.

In addition to identifying potential sources of climate finance, the AGF estimated the potential value these might contribute in 2020 based on various assumptions and scenarios. Complex modelling produced three carbon price scenarios – low, medium, and high – with a medium carbon price of USD 20–25 per ton fundamental to achieving the USD 100 billion. The assumption that carbon pricing would be widely implemented underpinned all of the AGF's potential revenue estimates. The sources were also reviewed against an agreed set of criteria: revenue, efficiency, equity, incidence, practicality, reliability, additionality and acceptability.

Agreement about which sources should actually count toward the USD 100 billion was never reached, despite the high political level of many AGF participants. Instead, the report highlighted the perspectives of different AGF members as possible alternatives (for example, counting gross versus net flows).

The report underscored the importance of including a wide variety of sources, public and private, bilateral and multilateral, including 'alternative sources of finance', to deliver the necessary scale. The report's insights ultimately fed into and were noted by the UNFCCC process.

In 2011 the IMF, OECD, World Bank Group, and regional development banks prepared a follow-up paper at the request of the G20 Finance Ministers (WB, 2011). The G20 paper built upon the AGF Report findings and elaborated options to introduce some of the instruments identified, further refining some of the quantitative ranges of potential climate finance. The G20 study results mirrored the AGF results. It highlighted the potential flows that could be generated by implementing carbon pricing and mechanisms to collect revenues from international transportation, fossil fuel subsidy reform, and carbon offsets. It also stressed the importance of multilateral development banks, and leveraged private flows.

Methods and approach

CICERO and Climate Policy Initiative have prepared this technical report. Section 3 describes material developments in how sources, actors, and instruments relevant to providing climate finance to developing countries appear to be functioning. Section 3 uses the AGF report as its starting point, before discussing some recent developments that have seen the emergence of potential new sources of climate finance, and new actors and instruments. This report does not revisit or apply the AGF's assessment criteria and quantitative methods, but draws instead recent reports and literature, an international group of experts, and the expertise of the project team.

The report presents quantified estimates of current flows (international and domestic) where these are available in the literature, but no new modelling has been undertaken. The additionality of each source is not specifically assessed, nor are net flows estimated. The quantitative estimates presented are based on a range of starting points for defining 'climate finance' as well as different assumptions and methodologies for counting. Estimates across sources, actors and instruments may not be comparable, and should not be added to a sum total due to the potential for double counting and unresolved challenges.


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2. Global Trends Impacting Climate Finance

This section provides an overview of some of the most significant changes and trends that have emerged in climate finance globally since 2010. Many of these have created both challenges and opportunities for countries in responding to climate change.

While global climate finance still falls far short of estimated investment needs,[1] there is growing evidence that governments and private actors can integrate climate investments into their growth and business models. In particular, improved policies and incentives, and more dedicated institutions are helping to align public and private interests and unlock a growing pool of climate finance investment flows for adaptation and mitigation despite a challenging economic situation for many countries.

1 See for example, International Energy Agency estimates that an additional USD 1.1 trillion in low-carbon investments is needed every year on average between 2011 and 2050, in the energy sector alone, to keep global temperature rise below two degrees Celsius (IEA, 2014).

‹ Wind turbines and brick making at Cape Comorin, India

2.1 CHALLENGES AND OPPORTUNITIES FOR CLIMATE FINANCE IN THE CURRENT ECONOMIC ENVIRONMENT

The challenge presented by high-carbon economic development has escalated significantly in recent years. Since 1990, unprecedented levels of economic growth, particularly in large emerging economies, have increased developing countries' share of world GDP from around one quarter to more than two fifths, and lifted hundreds of millions out of poverty – 500 million in the last decade alone (NCE, 2014). Based largely upon fossil fuel combustion, carbon-intensive industrial processes, and rapid expansion of large-scale agriculture, the emissions associated with this economic growth have compounded the problem of global greenhouse gas (GHG) emissions concentrations from developed countries (IPCC, 2014).

Increased GHG concentrations are already changing the climate and the effects are being felt. Observed impacts include temperature increase, changed precipitation patterns, and disruptions in agricultural growing seasons – all are likely to become more severe (IPCC, 2014). Climate impacts pose particular challenges to delivering strong, equitable, and sustainable growth to the world's poorest who lack access to financial and other resources that would help them address and adapt to climate risks.

The global economy faces a significant climate investment challenge going forward. The New Climate Economy (NCE) estimated that USD 89 trillion will be invested in infrastructure by 2030 across cities, energy and land use systems, even before accounting for climate action. However, it is possible that over the next fifteen years the additional investment required to make that infrastructure low-carbon and carbon-resilient could be less than 5 %, and that this cost could well be offset by lower operating costs (USD 4.1 trillion) (NCE, 2014). However, redirecting finance and investment from the high-carbon to the low-carbon economy will require huge shifts in planning and investment to align the government policies, support, and institutions responsible for the delivery of public goods and services, and the private investments that will ultimately pay for many of them. Strong international and domestic policies and enabling environments that set incentives for climate-friendly investments are essential in all countries to drive action, set price signals, and attract the necessary level of private investment.

The financial crisis of 2008 and the economic recession which followed have led to a more difficult economic environment including for climate policy and finance. The period since 2010 has seen most economies shift to a lower growth path. In developed countries, GDP growth has dropped from 2.5 % in 2007 to 1.1–1.5 % in 2010–2014. In developing countries, growth has dropped from 8 % to 5–6 % in 2010-2014 (UN WESP 2015). The results of lower growth are felt in weaker public finances, higher unemployment and more social unrest. Despite the recent economic recovery in some countries, governments can find delivering climate policy and increasing international public climate finance difficult given the many other competing priorities. There is strong pressure to demonstrate that public contributions to climate finance are effective and efficient, including by mobilising private flows.

In the immediate aftermath of the financial crisis, partly coordinated, multi-billion dollar stimulus packages aiming to avoid a slide into depression demonstrated the potential to align climate and economic growth needs (Prasad et al., 2009). Although many stimulus packages prioritised short-term discretionary fiscal measures targeting consumer demand, some sought to catalyse longer-term structural shifts required to transition to a low-carbon economy at the local and global levels, by tackling both supply and demand. HSBC identified USD 436 billion out of almost USD 2.8 trillion in fiscal stimulus that targeted climate change themes. For example almost 40 % of China's USD 586 billion 2008 stimulus was allocated to 'green' themes, most notably rail, grids and water infrastructure, along with dedicated spending on environmental improvement. Likewise the United States' green stimulus (USD 112 billion) was seen as a real boost to renewables (USD 94 billion) (HSBC, 2009) with the potential to drive innovation and capacity at scales capable of securing longer-term cost reductions.

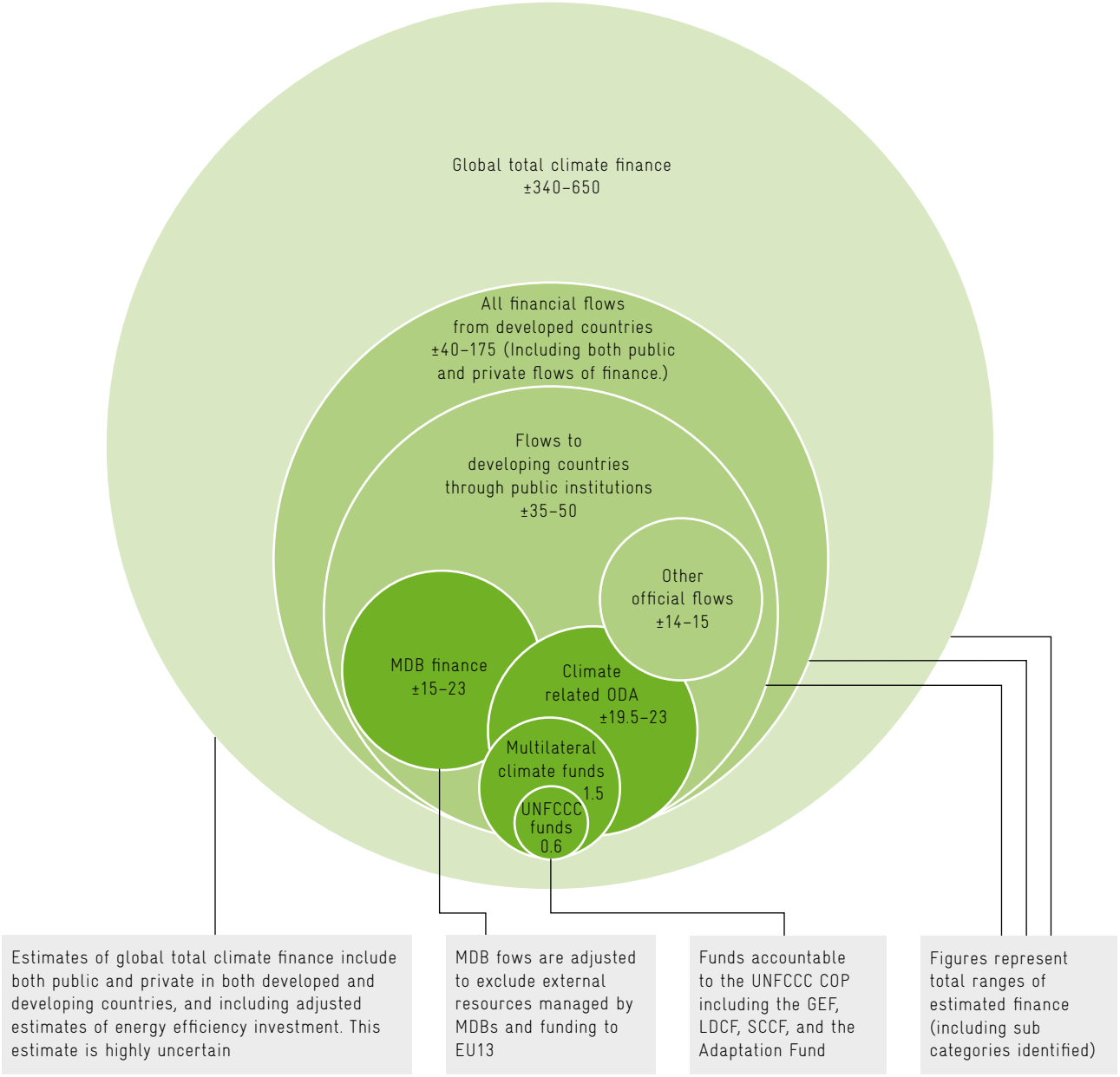
Climate finance has reached substantial scale in the last five years but is still below the level required to achieve low-carbon and climate-resilient growth. Even with existing methodological challenges and major difficulties tracking private investments, the UNFCCC's Standing Committee of Finance (SCF) reviewed countries' Biennial Reports in 2014 as a basis of global estimates of climate finance. The SCF estimated that between 2010 and 2012, global climate finance – domestic and international as well as public and private – ranged from USD 340 to USD 650 billion[2] per year (UNFCCC, 2014, see *Figure 1* below) and at least USD 331 billion in 2013 (Buchner et al., 2014).[3] The SCF blended different data sources to arrive at these global estimates finding that flows from developed to developing countries ranged from USD 40 to USD 175 billion per year from 2010-2012, including USD 35 to 50 billion per year directed through public institutions. Following publication, the SCF clarified in a separate note that the actual number for North-South flows is closer to the lower bound, in line with other recent estimates (cf. Buchner et al, 2013 and 2014). Total bilateral climate-related Overseas Development Assistance (ODA) commitments by members of the OECD Development Assistance Committee (DAC) has increased at a steady pace and reached USD 22 billion in 2013, representing 17 % of total bilateral ODA (OECD, 2014f). Developed countries also contribute other flows such as Other Official Flows toward climate finance (see section 3.2 – Government Budgets). In total, they contributed between USD 29 billion and USD 39 billion in climate finance flows to developing countries in 2013 (Buchner et al., 2014). In 2012 and 2013, total public climate finance for adaptation (excluding domestic budgets but including national development bank contributions) ranged between USD 23 and 26 billion (UNEP, 2014b).

2 The range captured by the Biennial Assessment methodology is due to how estimates are reported. The report states, 'several sources of climate finance are not fully captured by these estimates so the total may be higher. Some of the sources included report the full investment rather than the climate component. If estimates were linked to the incremental costs, the totals might be lower'.

3 Estimates made by Buchner et al 2014 capture only private investments in renewable energy, and do not capture private investments in energy efficiency, adaptation, transport, land use etc. because reliable, project-level data on these investments does not yet exist.

Figure 1: Standing Committee on Finance Estimates of Climate Finance

Climate finance flows (USD billion and annualized)



Quality of measurement and reporting: Relatively certain · Medium certainty · Relatively uncertain

NOTES TO DIAGRAM

1. Estimates of global total climate finance, which are probably conservative figures include both public and private finance, and incorporate adjusted estimates of energy efficiency investment.
2. Bilateral ODA flows are adjusted to exclude funding through multilateral climate funds to reduce double counting.
3. MDB flows are adjusted to exclude external resources managed by MDBs and funding to economies in transition/developing countries.
4. Other official flows (OOF) consist of: i) grants or loans from the government sector not specifically directed to development or welfare purposes and ii) loans from the government sector which are for development and welfare, but which are not sufficiently concessional to qualify as ODA. These flows are channelled through bilateral channels (e.g. IDFC members, OPIC)
5. Figures represent total ranges of estimated finance (including sub categories identified).
6. The representation is not to scale.

Source: UNFCCC Standing Committee on Finance 2014 Biennial Assessment and Overview of Climate Finance Report

There are opportunities for governments to use the recent decline in oil prices to level the playing field between fossil fuel intensive and low-carbon investments. Investments in fossil fuels continue to outweigh clean energy investments, while subsidies create an unequal playing field, and a growing risk of either stranding fossil fuel assets or 'locking-in' emissions. In 2014, the IEA reported that investments in oil, gas and coal extraction, transportation, oil refining and fossil fuel power plants more than doubled in real terms since 2000, and reached USD 950 billion in 2013 (IEA, 2014). The 46 % drop in oil prices over the last year could incentivise a dangerous shift back toward less expensive fossil fuel investments if left unaddressed. Governments around the world provide subsidies for fossil fuels. In 2013, the value of global consumer subsidies that governments paid to support fossil fuels (USD550 billion) – was more than four times the value of support for renewable energy (USD121 billion) (IEA 2014). Fossil fuel subsidies are not only holding back much needed investments in energy efficiency and renewables, they are also very costly for government budgets. Removing fossil fuel subsidies is politically difficult. Progress has however been achieved in some countries e.g. in Egypt, Indonesia and Nigeria. According to the IEA a well-planned phase out, including a careful assessment of impacts and how to mitigate these are essential. In addition consultation and good communication at all stages of the process must be ensured (IEA 2014).

However the drop in oil prices has also presented governments with two opportunities to reduce the competitive gap between fossil and non-fossil alternatives without impacting the final cost to consumers. First, governments could redirect finances already budgeted to cover fossil fuel subsidies to support adaptation or mitigation investments. Second, governments could speed up the removal of fossil fuel subsidies and/or introduction of carbon pricing at a time when the costs to the consumer are low or negative. Removing fossil fuel subsidies could decrease global GHGs by 6–13 % by 2050 (GSI/ISSD, 2015) in part by making renewable options more competitive.

Political leaders recognise the importance of this issue but progress has been slow. In 2009, G20 Leaders committed to "rationalise and phase out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption", while recognising "the importance of providing those in need with essential energy services, including through the use of targeted cash transfers and other appropriate mechanisms".

Lower clean technology costs and falling interest rates mean project developers and households are installing more renewable energy at less cost. Since 2010, many renewable technologies have become more cost-competitive as levelised costs of electricity (LCOE) from utility-scale renewable technologies have fallen. Biomass, geothermal and hydropower are all mature technologies that, where unexploited economic resources exist, can provide the lowest cost electricity of any source. Falling interest rates have helped. They are particularly important for the competitiveness of renewable energy because upfront investment costs are higher for green energy than fossil fuel energy production. Falling capital costs and technological advances have increased capacity factors and led to a reduction of LCOE for onshore wind which is now typically in the same cost range, or lower, than that of fossil fuel power generation making this technology one of the most competitive sources of electricity available (IRENA, 2015). The largest renewable energy cost reductions by far have been achieved in solar PV module prices which, in 2014, were 75 % lower than their levels at the end of 2009, contributing to a drop in total installed costs of utility-scale PV systems of between 29 % and 65 % depending on the region. The LCOE of residential solar PV systems has also fallen 42 % to 64 % between the beginning of 2008 and 2014 (IRENA, 2015). The same amount of climate finance is achieving more than before.

2.2 DOMESTIC POLICIES AND ENABLING ENVIRONMENTS

Many governments are projected to make significant investments in infrastructure that will support populations for decades to come. There are many opportunities to make these investments low-carbon and climate-resilient, as much of the infrastructure in OECD countries is in need of replacement and upgrading, while in developing countries, a major part of stock required for development is yet to be built (Corfee-Morlot et al., 2012). Redirecting finance and investment within and across sectors from high to low-carbon development require huge shifts in planning and investment to align the governments responsible for the delivery of public goods and services, and the private investments that will ultimately pay for the largest share. The most effective private sector activities take place within robust and predictable regulatory and economic frameworks whether in developed or developing countries. In developing countries, such enabling environments could also be crucial to leapfrog high carbon systems with lock in effects. Strong measures are needed by governments to set the right price signals, regulatory environments, and incentives that reduce risk, for climate-friendly investments.

There has been an increase in formal government actions to promote mitigation but policies on adaptation have lagged behind. Around 40 % of countries covering 73 % of the global population and 67 % of greenhouse gas emissions now have climate legislation or strategies. These can take different forms, such as economy-wide instruments, renewable energy targets, energy efficiency performance standards, the establishment of institutions to manage performance, or dedicated climate change bodies with some independence from executive government that analyse department plans and monitor compliance with carbon budgets (IPCC, 2014a). Policies for adaptation to climate change, (including increased climate variability), are less advanced but experience is growing across regions in the public and private sector and within communities (IPCC, 2014). Examples include governance systems for adaptation, livelihood diversification, coastal and water management, and disaster risk management. The lag is partly caused by the notion that mitigation precedes adaptation (IPCC, 2014). Most national climate policy initiatives in low-income countries focus on adaptation activities, through the National Adaptation Program of Action. International technical and financial assistance can target knowledge gaps and build capacity, reduce costs and boost returns of climate-friendly investments to support the development and implementation of policies and enabling environments that encourage public and private investment in mitigation and adaptation in developing countries, building upon experiences of success and failure gathered over the last decade.

Nations and regions have piloted and established carbon pricing, sending price signals across their economies. Enacting domestic carbon pricing policies – whether as a tax or an emissions trading scheme – requires a significant amount of political will – both to put the relevant policies into effect initially, and to enforce and enhance them over time. Nevertheless, at the UN Secretary-General's Climate Leadership Summit in September last year, 73 countries and 11 states and provinces, responsible for 54 % of global emissions and 52 % of GDP, signalled their support for carbon pricing. This statement on carbon pricing was joined by 11 cities and more than 1,000 businesses and investors. Since 2010, Japan (2012), UK (2013), and France (2014) have each introduced carbon taxes. Emission trading systems also expanded in 2013 to six new jurisdictions (seven pilots in China, Switzerland, Kazakhstan, California, Quebec and Tokyo) and to South Korea in 2014. The Chinese national system, when introduced in 2016, is set to be the largest in the world. South Africa, Chile and Mexico are expected to introduce carbon pricing instruments between 2016 and 2018. South Africa and Mexico have chosen an approach that combines a carbon tax with an offsetting system.

The European Emissions Trading System (EU-ETS), the world's largest trading system, has delivered important lessons for the emergence of new systems, amongst others through its sequential design that allowed initial inadequacies to be dealt with. Most importantly, it confirmed that the overall ambition – expressed in the stringency of the emissions cap – is central to ensuring an adequate carbon price (Ellerman, Convery and Perthuis, 2010). Implicit carbon pricing such as energy taxation could also raise revenue for the government and have an effect on emissions (OECD, 2013b).

Around the world many companies now incorporate a real or shadow carbon price in their operations as tool to increase their efficiency and reduce their exposure to climate risk (CDP, 2014). Even though there is no explicit national carbon price in the United States, around 30 companies indicated that they used an internal carbon price ranging from USD 6 to USD 60 per tonne of CO_2. Most of these were energy-intensive firms such as BP and Exxon-Mobil, but also included Google, Microsoft, Disney, Walmart, and Delta Airlines. Globally, 150 companies that report to Carbon Disclosure Project (CDP) are using internal carbon pricing as a tool to drive investments in emissions reductions. This development might help governments gain necessary political support for policy reform to better reflect climate investment needs. Public institutions such as the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) have also introduced a shadow carbon price.

Regulatory standards aimed at improving performance and cutting pollution can also increase the cost of emitting carbon by establishing standards that must be fulfilled and penalizing actors who fail to meet them. They can include emissions and performance standards, technology standards and production standards. Energy efficiency building codes operate in the United States and European Union and increasingly in emerging markets such as India. Regulatory standards may pave the way to carbon pricing by increasing the cost of doing business for polluters (NCE, 2014). For example, the US Clean Power Plan sets state-level target emissions rates for power generation (lbs of CO_2/ MWh) while giving states significant autonomy over which policies and market mechanisms to implement in order to comply (C2ES, 2015).

Feed-in-tariff or support policies play an important role in promoting clean energy but also lead to lack of confidence if poorly implemented. A large number of countries and sub national regions have introduced support policies such as feed-in-tariffs (FiTs) and renewable portfolio standards, which have helped to drive diffusion (IPCC, 2014). They are recognised as being among the best known instruments to help to cover cost and viability gaps by providing renewable energy suppliers and investors with revenue certainty. Since 2010, feed-in-tariff policies have been used throughout much of the developed world to incentivise renewable energy deployment and developing countries are increasingly using them. They represent a significant driver of European renewable energy deployment, which has in turn resulted in global cost reductions for some technologies.

However, feed-in-tariff policies involve costs for taxpayers and consumers. Immature or too generous supporting policies have, in several cases (e.g. FiTs in Italy and Spain), had remarkable results for renewable energy deployment but at an unsustainable cost. In Germany, high FiT prices resulted in growth in installation for solar PV exceeding expectations, over supply of electricity, and higher than expected program costs, necessitating several adjustments to the renewable program itself and to overall electricity market design. In Spain, high FiT prices and no cap on the level of renewable energy that could be deployed prompted much higher than expected solar deployment. When the cost of this became unmanageable, Spain was forced to retroactively change existing FiT policy, and in so doing, wiped out a significant amount of its solar market – with significant impacts on investor confidence and political

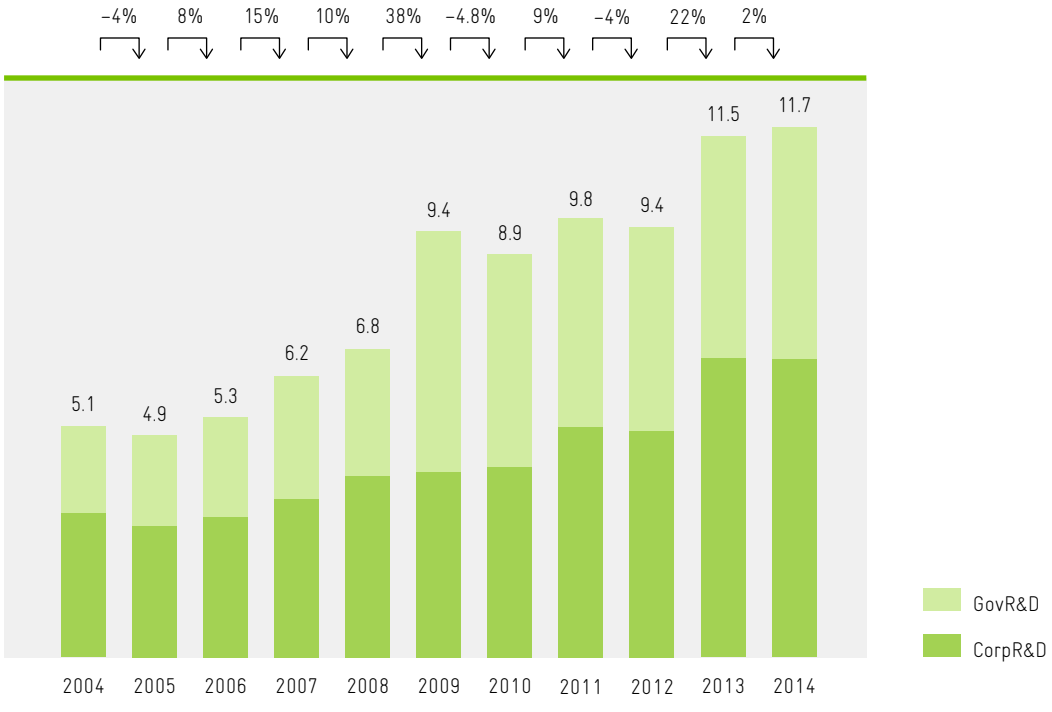
will going forward. Retroactive cuts to policies constitute one of the highest risks for private investors, especially foreign ones.

Other emerging policies to support green technologies include governments providing subsidised power purchase agreements through a reverse auctioning process, intended to close the viability gap between traditional and green technologies by also triggering competition amongst private actors (e.g., Brazil or India, cf. Stadelmann, Frisari and Konda, 2014).

Policies to support research and development in technology can complement adaptation and mitigation policies, and if properly implemented, can reduce costs. Technology push policies such as publicly funded research, development and deployment, combined with financing support demand pull policies (see the description of FiTs, power purchase agreements and reverse auctions above), can help to overcome the 'valley of death' between small-scale prototype phases and successful commercialization. *Figure 2* below illustrates that before the financial crisis and recession, public and private investment on research and development (R&D) was broadly equal. Public R&D jumped in 2009, partly due to 'green' stimulus, and then remained relatively stable before rising again in 2013 and reaching USD 5.1 billion in 2014. The figure illustrates that total R&D investment in 2014 was almost 25 % higher than in 2012, with corporate investments out paying governments by nearly 30 %. R&D spending in developed countries has been instrumental for supporting low-carbon technologies and facilitated more investments. Even so, worldwide public investment in research in support of climate change mitigation is small relative to overall public research spending (IPCC, 2014).

Figure 2: R&D Investment in Renewable Energy 2004-2015

Growth



Source: Bloomberg, Bloomber New Energy Finance, IEA, IMF, various government agencies

2.3 DOMESTIC AND INTERNATIONAL PUBLIC FINANCE[4]

The public sector is a key driver of climate finance of the climate finance system in part because it is likely to continue to play a leading role commissioning green- and climate-resilient infrastructure (Corfee-Morlot et al., 2012). Since 2010, annual contributions by public institutions to global climate finance, domestic and international, have grown to between USD 134 and 140 billion (Buchner et al., 2014). Governments have at their disposal a substantial tool box of policy and financial instruments that can pay for public goods and services, and cost and viability gaps that private actors are unable or unwilling to bear. These financial instruments are particularly relevant for adaptation and policies and incentives that improve the balance between risks and returns for specific classes of investors and end-users (see the Section above 'Domestic policies and Enabling Environments).

Domestic public finance can pay for enabling environments and institutions, technical assistance, incremental costs (for example FiTs), project-specific grants and loans, and direct equity investments alongside commercial finance to build confidence, speed up financial closure, or take more risky positions in mezzanine structures. For example, in 2012 public finance for renewable energy primarily originated in Germany and China, and was reinvested back into those same countries (Buchner et al., 2013). The ability and willingness of governments to dedicate public finances to climate actions depends on many factors ranging from fiscal and technical capacity, to political considerations. Mainstreaming climate action into broader national economic, social and development planning can reduce perceived trade-offs, build complementarity and increase co-benefits, making it easier to dedicate public financial resources (IPCC, 2014 and OECD, 2009).

Governments can also use public finance to take indirect investment positions, as shareholders. In recent years as financial data has improved, it has become possible to peel back several layers of ownership structures to identify government owners. These arrangements are typically relevant to the delivery of strategic goods and services such as electricity, water, and development aid. For example, governments often have an active shareholding in state-owned entities that were or still are state monopolies. Active and passive shareholding is practiced by governments in both developed and developing countries. In 2013, at least USD 42 billion of public money was identified as the 'ultimate owner' of large-scale, 'private' investments. While this is the case in many countries, the importance of public shareholding is particularly marked in China where 84 % of the investments tracked have some degree of public shareholding, and notable in the U.S. (68 %) and Germany (54 %). This money was directed to support and accelerate local deployment of renewable energy, reflecting amongst others, the effect of domestic policies incentivizing uptake (Buchner et al., 2013).

4 This section does not consider bilatateral or multilateral development financial institutions, which are dealt with separately in Section 3.

There is very little information available about actual domestic public budgets for domestic climate change both in developed and developing countries. In 2014, robust data (not necessarily about 2014) was available for only a very small number of countries (Bangladesh, Cambodia, France, Germany, Indonesia, Morocco, Nepal, Samoa, Thailand and the United States), see Buchner et al. (2014). In industrialised countries, both the US government (2013) and the EU commission (2013) are tracking expenditures tackling climate change, but methodologies are not harmonised. Research institutions have come up with estimates for domestic climate budgets in Germany (Juergens et al., 2012) and France (Morel et al., 2014). In developing countries the Climate Public Expenditure and Institutional Reviews (CPEIRs) conducted by the UNDP and the World Bank, have helped governments integrate climate financing into development planning and a comprehensive climate fiscal frameworks.[5] CPEIRs highlight how much developing countries are spending publicly on climate, and how climate-related expenditures (both domestic and external) are integrated into national budgetary processes, within the context of the national policy and institutional arrangements that exist to manage the response to climate change in each country. CPEIRs conducted by the UNDP and the World Bank (2013b, 2014) revealed that the seven developing countries mentioned above commit together around USD 3 billion of their own budget resources for climate change activities each year (Buchner et al., 2014).

National development banks (NDBs) have emerged as key players in low-carbon development in many countries with less mature capital markets including China, Brazil and South Africa. Their privileged position as executors of local development mandates and administrators of both reimbursable and non-reimbursable public resources[6] means they can also facilitate efforts to mainstream climate changes into broader development objectives. Of particular relevance to climate finance, NDBs are in the business of financing and risk taking, particularly in support of long-term investments. By using lower-cost public capital, NDBs can significantly lower financing costs that would otherwise make investments in these markets unviable (NCE, 2014). They committed almost USD 70 billion for climate change in 2013,[7] both in developed and developing countries (Buchner et al., 2014), and some of them are an important channel for multilateral and bilateral development finance, for instance, by on-lending credit lines to local commercial banks (see credit lines at CORFO in Chile). China Development Bank is the largest NDB and is also involved in South-South lending (Sanderson and Forsythe 2013). Investment mandates and strategies should take into account the risks of crowding out private investors, which can lead to sub-optimal cumulative investment levels over time.

5 See e.g. http://www.aideffectiveness.org/CPEIR and Bird, N. et al. (2014).

6 See e.g. the Brazilian Climate Fund Program (BNDES 2015) for re-imbursable resources.

7 This finance consists both of capital raised on capital markets and funding from national budgets.

Developed countries have scaled up international public climate finance since 2010. The UNFCCC's Standing Committee on Finance reported in 2014 that fast-start finance (FSF) committed and reported by developed countries for the period 2010–2012 exceeded USD 33 billion – beyond the original FSF goal of USD 30 billion (UNFCCC, 2014). 48–78 % of fast-start finance was reported as having mitigation outcomes (UNFCCC, 2014). Around USD 14.8 billion of FSF was provided as loans, guarantees and insurance, USD 14.3 billion as grants and related instruments, USD 1.5 billion as capital contributions and USD 1.1 billion through other instruments (Nakhooda et al., 2013). The Biennial Assessment and Overview of Climate Finance Flows (UNFCCC, 2014) also found that public flows from developed to developing countries ranged from USD 35 to 50 billion per year in the period 2010–2012.[8]

The Green Climate Fund (GCF) has opportunities to shift the climate finance paradigm. The GCF will channel new scaled-up financial resources from mostly developed and some developing countries, and target these to catalyse public and private climate finance at international and national levels. It will take the provision of financial support under the UNFCCC to unprecedented levels. To achieve the goal of achieving transformative delivery, the GCF design includes some innovative approaches and seeks sufficient financial resources (see Harmeling et al., 2013). Decisions have been taken to move from project to more programmatic approaches, covering for example whole sectors or economies, and strong country ownership will be key. By the end of 2014, a group of developed and developing countries pledged more than USD 10 billion for its initial capitalization, making it the largest public climate fund in history.[9] The GCF is governed and supervised by a board that will have full responsibility for funding decisions and which receives guidance from the COP. The World Bank serves as the interim trustee, tasked with administering the GCF's financial assets for the purpose of, and in accordance with, the relevant decisions of the board. The GCF will seek to balance its funding between adaptation and mitigation, with 50 % of the funds, on a grant equivalent basis, dedicated to adaptation targeting those developing countries most vulnerable to the adverse effects of climate change. The GCF has a separate Private Sector Facility (PSF) to drive private investment. A Private Sector Advisory Group (PSAG) will make recommendations to the board on how the GCF, including its PSF, should engage the private sector in order to mobilise flows of private climate finance in developing countries and make best use of the knowledge on best available technologies. The GCF will pursue simplified and improved access to funding, including direct access through accredited national agencies, basing its activities on a country-driven approach and encouraging the involvement of relevant stakeholders.

8 Buchner et al. (2014) estimated USD 29 to 39 billion of finance flows from public institutions from developed to developing countries in 2013, including from MDBs.

9 So far 33 countries including eight representing developing countries have pledged USD 10.2 billion in contributions to the GCF. They are Austria, Australia, Belgium, Canada, Colombia, Chile, Czech Republic, Denmark, Finland, France, Germany, Iceland, Indonesia, Italy, Japan, Latvia, Lichtenstein, Luxembourg, Mexico, Monaco, Mongolia, The Netherlands, New Zealand, Norway, Panama, Peru, Poland, South Korea, Spain, Sweden, Switzerland, UK, and the US.

2.4 DEVELOPMENTS IN THE FINANCIAL SYSTEM AND NEW FINANCIAL PRODUCTS

The transition to a low-carbon economy will ultimately require the redirection of large volumes of private capital. Private investors have contributed USD 1.4 trillion of cumulative greenfield investment[10] in clean energy globally between 2004 and 2012 (OECD, 2014) but much more is needed. For example, the International Energy Agency (IEA, 2014) estimate that from 2011 to 2050, an additional USD 1.1 trillion of investments in the energy sector alone is needed each year on average, to keep global temperature rise below 2° Celsius.

The capital exists to fund the transition to a low-carbon climate-resilient economy, so long as the owners of capital have incentives and understand opportunities and risks associated with redirecting (or not redirecting) their investment from 'brown' into to 'green' activities**.** In the mainstream financial markets, actors are gradually responding to changing climate policy dynamics and paying close attention to better information about how climate impacts will impose risks on their business models. Since 2010, key trends have emerged in how central banks, intermediaries and investors respond to a growing focus on climate change. If governments can understand and leverage these trends, they may be able to open up greater pools of capital for climate finance.

Since 2010, institutional investors have emerged as a class of actors with high potential to impact climate investor flows. In 2013, institutional investors, including public and private pension funds, insurance companies, Sovereign Wealth Funds, mutual funds and foundations, held an estimated USD 93 trillion of assets in the OECD (OECD, 2014e) alone. Finding ways to unlock and redirect their capital toward green investment in both developed and developing countries has become a major climate finance focus.

Since 2010, institutional investor groups and coalitions have pledged to mobilise significant amounts of climate finance. An investor statement from a group of institutional investors called for a global climate change agreement ahead of the Copenhagen COP15 meeting in 2009, put the onus on governments for the first time to provide clear, credible, long-term policies to drive institutional investors' climate investments (Ceres, 2009). In 2014, the same investor groups repeated the call, but added their own commitments to pursue climate investment products across their portfolios:

- The Montreal Carbon Pledge commits institutional investors to measure and disclose the carbon footprint of their equity portfolios on an annual basis with an aim to attract USD 3 trillion of disclosed equity assets by the end of 2015 (PRI, 2014).

- The Portfolio Decarbonisation Coalition aims to decarbonise USD 100 billion of equity assets by the end of 2015 (PDC, 2015).

- Some individual pension funds have announced allocations of 3-9 % of assets to low-carbon investments although how much of these investments flow to developing countries is not clear (UNEP & GICC, 2014).

10 Greenfield investment occurs when parent corporations enter another country, usually a developing one, to construct new facilities.

- At the UN Climate Change Summit in New York in September 2014, the insurance industry committed to a climate-smart initiative. Within this, the two main global organisations the International Cooperative and Mutual Insurance Federation (ICMIF) and the International Insurance Society (IIS) committed to increase current climate-smart investments to USD 420 billion by 2020.

The emergence of new green or climate-aligned investment products has enabled investors to have more proactive climate investment strategies. Clean energy stocks have yet to rebound from their post-crisis drop, however the assets that clean energy companies have developed have begun to perform at the scale and risk profile necessary to attract institutional investors. Fifteen renewable energy YieldCos[11] have been spun off in recent years raising USD 5.6 billion in 2013 and 2014 (FS UNEP, 2015). The aggregation of proven and long-term cash flows of projects for shareholders allows large operators and developers to raise new funds for further development. In Europe in particular, institutional investors have also shown appetite for direct ownership of operational renewable projects through infrastructure equity holdings (FS UNEP, 2015).

Labelling existing investment flows has allowed the growing green bonds market to gain traction with investors and provide another investment option alongside their sub-sovereign and corporate bond portfolios. Green bonds (see Section 3.8) totalled USD 53.6 billion in outstanding value at the end of 2014 (CBI, 2014a). In equity markets, index providers have begun offering a wide range of environmental, fossil-free and green indices for investors to benchmark against (CPI, forthcoming).

There is also growing pressure on investors to commit to fossil fuel divestment. Divestment occurs when private wealth owners, either individuals or groups, such as university endowments, public pension funds, or their appointed asset managers decide to sell assets held and then withhold capital from firms seen to be engaged in a reprehensible activity has emerged as a recent social trend (Ansar et.al., 2013). To date, USD 50 billion worth of funds including from cities, foundations and institutions have committed to divest for a mixture of financial and moral reasons (BNEF, 2014; GoFossilFree, 2015). If enough investors divest from particular sectors or companies, this could encourage a broader perception that climate risk is inadequately priced and that associated investments could be subjected to upcoming policy changes designed to disincentivise such activities.

Wider debates on whether financial markets are 'fit for the purpose' of facilitating sustained and inclusive growth in the real economy could also support investment in the low-carbon transition. Systemic risks brought to light by the financial crisis and slower than expected economic recovery have sparked debate on topics such as short-termism, fiduciary duty, remuneration frameworks for asset managers, and whether factors used in credit analysis contribute to a system that forsakes long-term, prudential investment, for short-term gain (UNEP, 2014). Environmental, social and governance factors (ESG) are now recognised by investors managing USD 45 trillion of assets as a valuable complement to traditional credit analysis.

11 YieldCos bundle renewable energy and other infrastructure-type assets into an investment vehicle that offers steady dividend yields. These vehicles can be appealing to institutional investors as they match the return requirements.

In addition to 'ethical' or 'social' trend factors, investors have started to allocate greater shares of their portfolios to emerging market securities, although these flows can be volatile (UN WESP, 2015). Mutual and investment funds now allocate 14 % of their equity portfolio to emerging markets and 12 % of their fixed income portfolio bonds, but this follows a reduction in recent years due to relative risk perceptions increasing in major emerging markets (particularly Brazil and Russia) and decreasing in developed markets (IIF, 2015). Pension funds and insurance companies have indicated that their own asset allocations are only likely to grow, to 10–20 % from a very low base for the former, and to 25 % and 7 % for insurance companies' equities and bond portfolios (PPIAF, 2015; IMF, 2014).

The impact of new financial regulations designed to reduce systemic risks in global financial markets on climate finance flows remain uncertain. There are concerns that new regulations such as the Basel III Accord on bank regulations and the Solvency II Framework for the European insurance industry could negatively impact the financing of long-term low-carbon or climate-resilient infrastructure assets by imposing higher costs on riskier lending[12] (OECD, 2015; Liebreich and McCrone, 2013; Spencer and Stevenson, 2013). As reforms are only implemented from early 2015 through to 2019, it is too early to judge if such concerns are warranted (FSB, 2014). Project finance loans from 2010-2013 remained higher than pre-crisis levels (Dealogic, 2013).

As many projects in developing countries are financed through short-term corporate lending, these regulations may have less of an effect than in developed countries. In addition, macroeconomic and political risks are likely to trump regulatory capital requirements as a factor in project financing where it does occur (CISL & UNEP 2014). In fact, financial regulators in many developing markets are proactive in tailoring regulatory rules that suit their specific domestic environments, and which recognise the value of sustainability considerations for achieving growth.

Commercial banks have a key role to play in most developing economies as they are the main financial intermediaries (see 'Bilateral DFIs and Agencies', and 'Multilateral Development Banks and Funds' in Section 3). On average they hold 63 % of financial assets as opposed to 42 % in developed markets (FSB, 2014). Unlocking local financial actors in developing countries has potential to lower financing costs, and to 'mainstream' climate investments into loan portfolios, due diligence assessments and general financial practices.

A number of central banks and regulators in developing countries are strategically aligning the climate finance investment priorities and risk assessment of governments with banking regulations (CISL & UNEP FI, 2014; UNEP, 2015). Examples include:

- Portfolio allocations: In Bangladesh, Fiji and India, financial institutions must allocate between 3–5 % of loans to green finance from 2016. Sector-specific lending to green sectors is encouraged in Lebanon, India, Colombia and China through regulatory guidelines and is currently being developed for Indonesia.

12 In general, reforms place an emphasis on minimum capital requirements and leverage ratios for different assets classes held on the balance sheets of banks and insurance companies according to their level of risk (FSB, 2014).

- Concessional refinancing: In Bangladesh and India, financing is provided to banks and microfinance institutions at reduced interest rates for loans given to priority areas such as renewable energy.

- Risk disclosure: Banks are required to report on exposure to environmental risks in their loan books in Brazil, China, Peru and Nigeria. In Brazil, an estimated 12 % of lending requires sustainability assessment.

Financial authorities' exploration of how climate change interacts with their financial policies may have an impact for banks globally. For example the G20 Finance Ministers and Central Bank Governors group is working to review how the financial sector can take account of climate risk. In the UK, the central bank has included climate change on its research agenda, exploring potential systemic risks from stranded assets and physical impacts as well as how its own monetary and disclosure policy setting levers may heighten or lower those risks (BoE, 2015). For example, the bank will submit a report to the UK government on adaptation risks in the insurance sector in 2015 following a reporting disclosure request to 30 companies.

2.5 IMPROVEMENTS TO REPORTING AND TRACKING CLIMATE FINANCE

In respect of public and private financial flows, better information is helping to inform decision makers, but significant gaps remain. Compared to 2010, today's picture of climate finance flows is more comprehensive, helping to improve our collective understanding about where the world stands in relation to global finance and temperature goals, to identify which kinds of support correspond most efficiently to different needs, and whether resources are being optimised. Since 2010, key developments include:

- **Fast Start Finance** reporting which occurred from 2011 through 2013, showed that countries cast a wide net around what they report as climate finance and that there are some consistencies as well as divergences. These reports have highlighted the need for transparent and harmonised tracking of climate finance flows.[13]

- **Biennial Reports** (BRs) by Annex 2 Parties to the UNFCCC were submitted for the first time in 2014. Guidelines, regular formatting, and clear reporting time frames are serving to build confidence about the information therein, but inconsistent definitions for reporting categories such as 'climate-specific' or 'other', and insufficient detail on components of 'funding sources' and 'financial instruments' (UNFCCC, 2014), mean there are still important transparency gaps. BRs do not normally include project descriptions, as is the case for reporting climate-market Official Development Assistance (ODA) under the OECD.

13 A special module for FSF is available at http://www3.unfccc.int/pls/apex/f?p=116:13:2163962344105143

- **Biennial Update Reports** by non-Annex 1 countries are submitted to the UNFCCC to provide succinct information on national GHG inventories, mitigation actions, constraints and gaps, including support needed and received.

- **Biennial Assessment and Overview of Climate Finance Flows Report** by the Standing Committee on Finance drew on the BRs and the existing literature (UNFCCC, 2014). It brings a new approach to knowledge-building on climate finance flows to the UN level: it aggregates data from different sources, assesses their quality and coverage, and gives policy recommendations on tracking methodologies, defining climate finance and assessing effectiveness, and is likely to inform future decisions around quantitative and qualitative elements of finance.

- **Tracking Advances for Bilateral agencies and DFIs include:**

  → In 2010 the **OECD Development Assistance Committee (DAC)** introduced a marker for 'climate change adaptation', in addition to the 1998 marker on mitigation.[14] It is currently developing a broader measure of Total Official Support for Sustainable Development (TOSD), which will also include non-concessional flows and flows mobilised by public sector activities (OECD 2014a). The OECD DAC is also working with the international community, including MDBs, DFIs and partner countries, to improve the quality and coverage of DAC's climate-related development finance statistics, as well as to facilitate discussions on enhanced approaches for common definitions and methodologies. Since 2013, DAC statistics have captured an integrated picture of both bilateral and multilateral climate-related development finance flows (OECD 2014f).

  → DFIs, including a **group of MDBs** comprising the African Development Bank (AfDB), Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), Inter-American Development Bank (IDB) and World Bank Group (WBG) – IFC & WB (AfDB et al., 2012a, 2012b, 2013, 2014) and the **International Development Finance Club**, a club of 22 international, regional and national public development banks, (IDFC 2012, 2013, 2014), have substantially advanced transparency on DFI climate finance by developing **joint tracking methodologies and reports**. In March 2015, they adopted 'Common Principles for Climate Mitigation Finance Tracking' as a voluntary effort (for example, conservative estimation, activity-based tracking, ex-ante tracking, disaggregation of climate from non-climate components, accounting of energy efficiency only if it prevents carbon lock-in and is substantially more efficient than existing technologies, etc.), and established a list of activities eligible for classification as 'climate mitigation finance'.

14 The markers for official development finance with climate change objectives (mitigation and adaptation) are part of the so-called «Rio Markers» that monitor official development finance for environmental purposes and were first introduced after the Rio Conventions in 1992 when developed country parties committed to assist developing countries in the implementation of the Climate Change, Biological Diversity and Desertification conventions, see OECD (2015). Rio marking is mandatory for official development assistance (ODA, consisting of grants and concessional flows), while it is voluntary for official flows (OOF, largely non-concessional loans) so data is partial.

They also committed to further working on the harmonization of both adaptation and mitigation finance tracking approaches (Climate Finance Forum, 2015). MDBs and DFIs are also developing standards for measuring mobilization of private finance (see Opitz and Morton, 2014, for a first initiative). In 2013, MDBs started to report project-level climate finance data to the OECD and are interacting for their Joint Report with the IDFC with the aim of harmonizing approaches.

- Led by Bloomberg New Energy Finance, **information on private climate finance flows improved,** providing more detailed financial flows to renewable energy technologies and developments related to technology costs. Based on this data, an annual report on global trends of renewable energy presents regular updates (Frankfurt School-UNEP Centre/BNEF, 2015). In addition, the OECD-coordinated Research Collaborative on Tracking Private Climate Finance pointed to a number of commercial (i.e. Bloomberg, Dealogic, Factset, Preqin, Thomson Reuters,) and public (i.e. OECD, UNCTAD, UNEP Risø Centre, World Bank) databases and examined their potential use for increasing coverage and understanding of the volume and characteristics of private climate finance (cf. Caruso and Jachnik, 2014).

- Currently, the OECD (2015), bilateral DFIs from industrialised countries and MDBs are working on methodological approaches to estimate mobilised private finance for their data collection. The OECD will also conduct a survey with development finance actors on private finance mobilised by syndicated loans, shares in collective investment vehicles and guarantees in 2015.

Nonetheless, differences in data quality and climate finance data gaps persist outside of a few areas. Private climate finance data derives mainly from BNEF's database, and is limited in scope (mostly renewable energy). There is currently a lack of information about domestic public climate budgets, private investments in adaptation, forestry and transport, and project-level estimates for private investments in energy efficiency. To improve understanding, it is required to make use of better and more consistently applied methodological approaches across these sectors and encourage more transparency at the project level. To put climate finance estimates into perspective, comparable estimates of trends in traditional high-carbon "brown" finance are needed. This will enable the climate community to track whether there is real progress towards a low-carbon, climate-resilient future and identify opportunities to shift financial resources towards more sustainable uses.

Transparent climate finance flows is not only a goal in itself but may also help all stakeholders to identify opportunities to further mobilise or use finance more effectively. It also is the first step to better understand how to count different types of financial support towards the USD 100 billion commitment, an issue that still remains open, and how to measure progress toward that goal.

3. Sources, Actors and Instruments of Climate Finance

‹ Transformer station in Mazar e-Sharif

3.1 INTRODUCTION

The original AGF report categorised climate finance sources into four groups: public sources for grants and highly concessional loans (including general public revenues, and 'new' instruments such as carbon taxes and fossil fuel subsidy removals), development bank-type instruments, carbon market finance, and private capital. Since 2010, understanding has grown about the complex interactions between sources, the role and decisions of key actors, and the importance of well-targeted instruments. This has enabled the more nuanced representation of sources, actors, and instruments in this report.

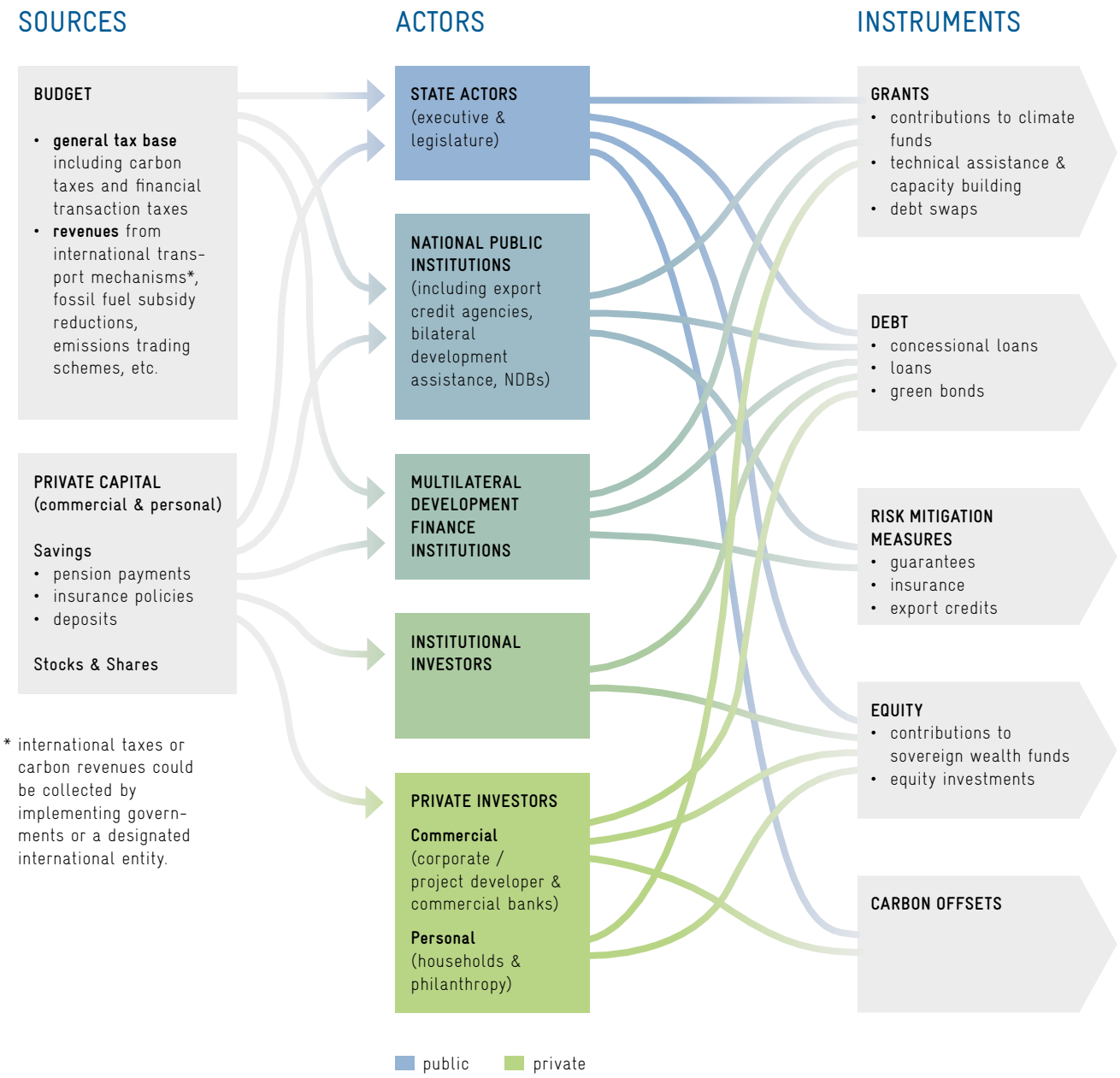
The objective of Section 3 is to describe a set of tools and their potential in order to inform decisions about how to raise and use public resources, how to target specific investment barriers and climate outcomes, and how to unlock increased climate finance flows. By distinguishing sources, actors, and instruments in the subsections that follow, the aim is to highlight the interaction between public actors' decisions about how to raise and apply public budgets on one hand, and private investors' responses to these drivers and measures, on the other. The discussions aim to highlight the different ways that public and private finance can combine to increase climate finance flows for adaptation and mitigation.

Figure 3 illustrates the current global climate finance system. It depicts the two principal sources of climate finance to the left – budgets and private capital. The centre column identifies the key actors whose decisions determine how public finance is delivered on one hand, and how private capital is invested on the other. The right column lists the main groups of instruments through which public actors channel finance to pay for public goods and services, close viability gaps (e.g. grants and loans), reduce costs and risks for private actors (e.g. insurance, guarantees), or into which public and private actors may invest (equity and debt).[15]

Each of the following sub-sections provides updated information about the relevance and role of different sources, actors and instruments in meeting the commitment of developed countries to jointly mobilise USD 100 billion per annum by 2020, from public, private and alternative sources, to support developing countries' climate actions. The report does not aim to conclude what should count towards the USD 100 billion, but rather to identify the most recent estimates where these are available in the literature, and the important developments that may impact their potential. Estimates across sources, actors and instruments use a range of definitional starting points, assumptions, and methodologies, may not be comparable, and should not be added together.

15 The examples offered for instruments are not exhaustive but attempt to highlight the main ones.

FIGURE 3: THE CLIMATE FINANCE SYSTEM



SOURCES

3.2 GOVERNMENT BUDGETS

Description

Government budgets are the source of the domestic and international public finance flows that drive the international climate finance system. Countries' tax bases provide the bulk of revenues to government budgets and can be expanded through the implementation of new taxes, levies and charges, some of which are explored later in this section. Governments can also raise revenues directly from capital markets.

In terms of domestic public finance, government budgets may be allocated to ministries and public institutions to implement public programs and deliver services across a range of domestic sectors via different policies and economic instruments that address specific investor needs. Decisions may also be made to invest directly through equity holdings alongside private investors, for example to help bring immature technologies to market or to address viability or cost gaps.

Government budgets are also the central source of Official Development Assistance (ODA). ODA can be provided as grants, concessional loans or equity, and is often channelled through or provided by bilateral agencies and finance institutions, or multilateral development finance institutions and funds.

The AGF expected that 'direct budget contributions based on existing public finance sources' would continue to play an important role in scaling up climate finance. The World Bank in its update for G20 Finance Ministers noted that generic limitations on increasing revenues (limited sources, particularly in times of fiscal austerity) or cutting spending for other uses (divergent political priorities) make it difficult to assess potential additional climate finance from government budgets (World Bank et al., 2011).

State of play

In 2013, public climate finance flows from developed to developing countries reached USD 29–35 billion, or 10 % of global climate finance captured (Buchner et al., 2014). This report presents two sources for statistics on climate finance provided by developed country parties to developing countries;

- Biennial Reports (BRs) submitted to the UNFCCC (UNFCCC, 2015) as the official source under the UNFCCC covers a range of public flows

- OECD data on Official Development Assistance with climate change mitigation and/or adaptation objectives.

The UNFCCC's Biennial Reports by industrialised (Annex II) countries reported USD 17.1. billion of climate specific finance for developing countries in 2012 and a further USD 11.8 billion in core general finance to multilateral institutions that partially targets climate change. The absence of agreed definitions for climate finance mean the accounting methodologies underlying the figures for climate finance in different countries' submissions to the UNFCCC may differ (e.g. some report only grants and concessional loans while others also report commercial loans), making it difficult to compare the official climate finance statistics across Biennial Reports. Core finance figures need to be treated with care. Several countries report core finance figures in their Biennial Report because it is demanded by the format, however, countries usually do not consider such core finance to be fully climate relevant.

The OECD Development Assistance Committee (DAC) database covers a longer and more recent time period, and provides more detailed information on a sub-set of public flows that are concessional enough to qualify as Official Development Assistance.[16] Most developed countries reporting to the UNFCCC draw upon OECD DAC data, however the methodology for what they choose to report varies. The variation mainly comes from the OECD DAC approach of marking activities as either having climate change action as the "principal" or as a "significant" objective. All countries report activities with climate change action marked as the "principal objective" to UNFCCC, but they report different shares of the activities with climate change marked as a "significant objective". Furthermore countries also include flows that are not covered by the DAC statistical system, particularly non-concessional loans in their Bilateral Reports. The following OECD DAC figures are therefore only illustrative of climate finance developments. They do not provide a clear picture of climate finance as it relates to the commitments reported under UNFCCC in particular.

OECD DAC figures show that, developed country governments have increased their bilateral commitments for Official Development Assistance (ODA) with reported climate change objectives, from less than USD 5 billion per year in the period 2005–2007, to around USD 22 billion per year in 2013.[17] The majority of this finance has mitigation and/or adaptation as its 'principal' objective, while the remainder specifies climate change as a 'significant' objective' (see *Figure 4*). It should be noted that not all countries consistently mark climate change as 'principal' or 'significant' objective'.

The actual overall increase in finance targeting climate change is overstated as countries only began marking interventions targeting adaptation from 2010 onward. That said, ODA with mitigation objectives has tripled from less than USD 5 billion per year in 2005–2007 to more than USD 16 billion per year in the period 2011–2013.

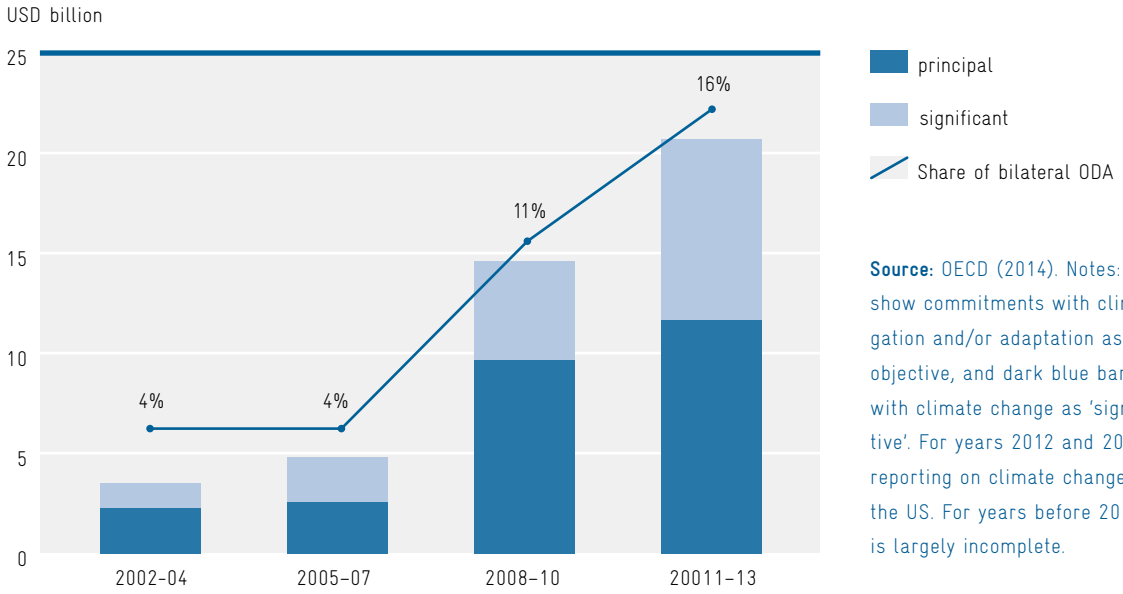
Of the total USD 22 billion of climate-marked ODA flows in 2013, 51 % was spent on mitigation, 30 % on adaptation and 19 % on both objectives. In terms of sectors, most funding was spent on transport, energy generation and supply (USD 5 billion each), and agriculture, forestry, and fisheries (USD 3 billion each), including both mitigation and adaptation activities. USD 11 billion was provided as grants, USD 10 billion as concessional loans, and USD 0.2 billion as equity (own analysis based on OECD 2014e, 2015b).

Apart from bilateral climate-related ODA, governments also channel ODA through multilateral institutions, such as climate funds and multilateral DFIs. The OECD (2014e) estimated that the climate-related share of developed country governments' contributions to ODA-eligible international organisations reached USD 3.4 billion in 2013, based on core contributions to the African Development Fund, Asian Development Fund, Inter-American Development Bank Special Fund, International Development Association, Global Environment Facility and its climate funds, the Climate Investment Funds, the UNFCCC, the

16 OECD DAC also collects data on other official flows (OOF) that do not qualify as ODA but climate change objectives are only reported for a small share of OOF.

17 The markers for ODA with climate change objectives (mitigation and adaptation) are part of the so-called «Rio Markers» that monitor ODA for environmental purposes and were first introduced after the Rio Conventions in 1992 when developed country parties commited to assist developing countries in the implementation of the Climate Change, Biological Diversity and Desertification conventions, see OECD (2015)

Figure 4: Trend in bilateral climate-related official development assistance, 3-year annual averages
2002–13, bilateral commitments, USD billion, constant 2012 prices



Source: OECD (2014). Notes: light blue bars show commitments with climate change mitigation and/or adaptation as the 'principal' objective, and dark blue bars commitments with climate change as 'significant' objective'. For years 2012 and 2013, there is no reporting on climate change objectives from the US. For years before 2012, US reporting is largely incomplete.

Adaptation Fund and the Montreal Protocol.[18] In addition to these USD 3.4 billion in ODA contributions, developed country governments from time to time contribute equity for capital increases to the non-ODA eligible MDBs (e.g. in 2009/2010), enabling them to increase lending for climate and other purposes in developing countries.

Statistics on climate finance from the Biennial Reports and on ODA do not only track outflows from government budgets. This is the case, for example, with loans by development banks. Public development finance institutions often receive a grant from government budgets, but in addition leverage finance from capital markets in order to offer concessional loans. Ideally, one would mark the grant as an outflow from a government budget, while marking the rest of the concessional loan value as an outflow from development banks. However, the size of these grants is often not known. To simplify this report's presentation, this chapter does not separate statistics on public finance flowing from government budgets from those flowing from bilateral and multilateral actors. More details on bilateral agencies, DFIs and MDBs are discussed in section 3.5 and 3.6.

18 This figure was calculated by estimating the climate-related share of each international organisation's portfolio and attributing this back to DAC members based on a pro-rata share of their core multilateral ODA disbursements in a given year.

Key messages

- Public budgets are a key source of domestic and international climate finance.
- Developed countries' climate-related bilateral ODA contributions, which include finance leveraged by public financial institutions on private capital markets, reached approximately USD 22 billion in 2013. An additional USD 3.4 billion was channelled through multilateral ODA-eligible institutions for climate-related activities.
- Public finance depends on political decisions in developed countries. Climate finance allocations could be increased by reallocating finance from within the existing tax base, expanding the tax base, or by raising debt. Improved economic capacity brings growing opportunities to contribute to international climate finance.

3.2.1 PUBLIC CARBON-RELATED REVENUES (CARBON TAXES AND ETS)

Description

The AGF report identified carbon pricing instruments as particularly attractive due to their ability to mobilise climate finance while at the same time providing incentives to take mitigation action in the most cost-efficient way. Strong commitments to domestic mitigation and the introduction of new public instruments based on carbon pricing are important for mobilising both public and private climate finance (AGF, 2010). According to the AGF, auctioning of allowances and new carbon taxes had the greatest revenue potential (USD 30 billion by 2020), assuming a medium carbon price of USD 20-25 per ton.

The World Bank report also showed carbon pricing to have the largest potential of the public sources, in the range of USD 25–50 billion (World Bank, 2011).

Carbon pricing could collect revenue by expanding the tax base through introducing a carbon tax or an emission trading system with some auctioning. It could also take the form of an implicit carbon tax, such as energy taxation. In some countries a carbon tax is added to broader energy taxes. Revenue depends on coverage of the instruments and the level of the carbon price. In addition, governments in developed countries need to decide whether to allocate at least part of the revenue to international climate finance. The AGF report assumed that between 2 and 10 % of the revenues generated from carbon pricing would be dedicated to international climate action.

The revenue potential of a carbon tax is derived from the tax level multiplied by the tons of carbon emissions covered by the levy. The actual potential to generate revenue for climate finance however depends on how the tax is designed. In an emission trading system, the revenue potential depends on the allocation method used for emission allowances. Regulators can either give allowances away (grandfathering or free allocation) or sell them, most commonly by auction. The latter raises revenues for the regulator. Without selling allowances, emission trading systems have no revenue potential for governments.

State of Play

Carbon taxes

Currently there are no examples of carbon taxes that are allocated directly for international climate finance; however, there are a number of countries that have introduced carbon taxation since 2010 (see Section 2). Assuming that a carbon tax increases revenue, their existence could put the government in a better position to allocate finance for international climate action. However, this depends on the tax design. For instance, in British Colombia the

government designed the carbon tax to be budget neutral. Revenue is generated by the carbon tax while other taxes are reduced at the same time.

Carbon markets

The majority of governments are recycling the revenue raised through carbon markets into domestic emissions reductions programmes (e.g. the European Union Emissions Trading System – EU-ETS, California, and the Regional Greenhouse Gas Initiative (RGGI)[19]). Only in the EU has some of the revenue generated by auctioning carbon credits been allocated for international climate finance. The total revenues for the EU were EUR 3.6 billion in 2013 (European Commission, Oct 2014). Member states reported that they will spend as much as EUR 3 billion of the total revenues from the auctioning of allowances on climate and energy. About three quarters of these revenues (EUR 2.3 billion) will go towards climate and energy finance within the EU, while around EUR 0.5 billion is reported to support third countries (without specifying further which countries). Some countries report that international resources collected by selling allowances are allocated to climate finance, including for international purposes. However, the UK, Denmark and the Netherlands report that auctioning revenues are not earmarked in their national budget, and therefore direct attribution to specific purposes is impossible in these cases.

The recession, limited policy ambition and poor historic data have undermined carbon markets' ability to provide significant amounts of climate finance by pushing allowance prices to low levels across the world. There are however positive signs that the markets are now performing better (Thomson Reuters Point Carbon, 2014b). Prices have stabilised, although well below the medium carbon price scenario that was used in the AGF-report. The average EU-ETS carbon price was EUR 6 in 2014 (Thomsen Reuters Point Carbon, 2014a). Policy makers are working on both shorter and longer-term market reforms (e.g. back loading, a market stability reserve and target setting for 2030 in the EU-ETS) that should increase that price.

Revenues for governments are growing as the share of allowances auctioned in developed country carbon markets increases year by year. More than 40 % of the 2013 annual allowances in the EU-ETS were auctioned (European Commission, 2015), compared to no more than 4 % from 2008–2012. This share is increasing, as the volume of allowances allocated for free decreases more quickly than the cap decreases. A 2012 amendment to the New Zealand emission trading system introduced a possibility to allow the auctioning of allowances. No auction has however taken place to date. About 10 % of allowances were auctioned in California in the first compliance period, and this share has increased in subsequent compliance periods (ICAP, 2015). The Analysis Group Consultancy has provided research that shows that the auctioning of CO_2 allowances in RGGI generated almost USD 1 billion of revenue between 2009 and 2011 (Analyst Group, 2011). At least 25 % of the proceeds were earmarked for low-carbon investments. According to the research the regulators ended up investing as much as 48 % of revenues in energy efficiency projects in the ten participating states. Despite its potential, carbon pricing has not delivered international climate finance as the AGF envisioned.

19 RGGI is a cooperative effort among the US-states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce CO2 emissions from the power sector.

Key messages

- Some developed countries have taken steps to price carbon, but this has not translated into significant increases in international climate finance.
- A few European countries have reported direct allocations to support international climate action.
- Governments are collecting more revenue from pricing carbon through auctioning an increased share of the allowances issued. The potential to direct revenues for international climate finance is clear, but requires additional decisions at national level.

3.2.2 REMOVAL OF FOSSIL FUEL SUBSIDIES

Description

If governments in developed countries were to remove fossil fuel subsidies, they could redirect those financial resources towards international climate finance. Removing those subsidies might also help to improve developed countries' economic framework for climate investments.

The AGF estimated that if developed countries a gradually removed fossil fuel subsidies, this could raise USD 8 billion for international climate finance, while a report carried out for the G20 by the World Bank (World Bank, 2011) estimated the potential to be in the range USD 4–12 billion. The AGF report based its estimates on what G20 developed countries proposed for phase out in the G20 context in 2009. G20 members report public support they consider to be inefficient fossil fuel subsidies. According to the AGF it was more realistic to base estimates on these G20 reports than higher estimates. The World Bank report used OECD estimates but made assumptions about the portion of the revenues that would be used to support climate action in developing countries, thus arriving at the USD 4–12 billion range.

State of play

So far no developed country has generated international climate finance through the removal of fossil fuel subsidies. However, current low energy prices offer a window of opportunity to phase out those subsidies, which could allow developed countries to redirect finance towards climate actions in developing countries in a way that is budget neutral. The Organisation for Economic Co-operation and Development (OECD) estimated the value of support for fossil-fuel production and consumption in developed countries at USD 55–90 billion per year in 2005–2011 (OECD, 2012).[20] The value amounted to USD 84 billion in 2011 and has increased since 2005 (USD 55 billion). OECD has identified more than 550 individual producer or consumer fossil fuel support measures in OECD countries (OECD, 2013).

Experience shows that it is not easy to reform or phase-out harmful and costly subsidies, given the vested interests of those that benefit from them (OECD, 2012). There has however been progress in phasing-out inefficient fossil fuel subsidies in recent years in particular in the coal industry. Historically, coal was supported by various social benefits to coal miners and the regulation of coal prices. For example, in Germany the total value of producer support for hard coal amounted to about EUR 5 billion in 1999. The government will phase out this subsidy by 2018. Poland is estimated to have provided more than USD 7 billion in total to support coal producers from 1999 to 2011 but similarly to Germany has now decided to gradually phase out government support. Since 2011, EU regulations only

20 These numbers include OECD countries such as Mexico, Chile and Korea.

allow for state aid for the purpose of closing down mines, treatment of health problems for miners and addressing environmental liabilities related to past mining.

Despite political agreements to phase out inefficient fossil fuel subsidies that encourage wasteful consumption (G20, 2009), the total value of the subsidies in OECD countries increased from 2005 to 2011 (OECD, 2012). This increase owes much to world crude-oil prices. There has been some progress in particular when it comes to phasing out support for the coal industry but often these reduced expenditures are absorbed in the general government budget. No countries have so far redirected fossil fuel subsidies explicitly towards international climate finance.

Key messages

- So far no developed country has generated international climate finance by removing fossil fuel subsidies.
- Current low energy prices offer an opportunity to phase out fossil fuel subsidies.
- The potential associated with phasing out fossil fuel subsidies, even in developed countries, depends on political will.

3.2.3 INTERNATIONAL TRANSPORTATION MEASURES

Description

Internationally coordinated carbon-related instruments on international transportation could potentially mobilise significant additional public resources for climate action in developing countries because these emissions are untaxed and therefore represent a potential new source of finance (AGF, 2010). According to the AGF-report, levies on international transportation could contribute approximately USD 10 billion to international climate finance. The G20 follow up study estimated the source potential to be USD 7–11 billion (World Bank, 2011). Both studies assumed that 25–50 % of the total revenues would be allocated to international climate finance. The AGF report listed different instruments to mobilise funds such as a fuel levy or emission trading system for maritime bunker fuels and either a fuel levy, emission trading system or a passenger ticket tax for the aviation sector. At the same time, the AGF considered these instruments faced policital challenges due to incidence falling on developing countries themselves, and in difficulties attributing emissions to individual countries.

State of play

Aviation

In October 2013, governments meeting at the 38th International Civil Aviation Organisation (ICAO) Assembly agreed to develop a global market-based measure (MBM) for international aviation for the first time. This will be considered at the next ICAO Assembly in 2016, for implementation from 2020. According to a statement delivered at the UN Climate Summit in New York 2014, ICAO, governments, civil society and the aviation industry are working in partnership to deliver a robust worldwide measure to achieve ICAO's and the aviation industry's goal of stabilising international aviation's net CO_2 emissions

from 2020 through carbon-neutral growth. The proposal most discussed at the moment would raise some climate finance through the carbon market, though far less finance than the AGF anticipated. The statement, didn't address the issue of directing revenues collected through these measures to international climate finance.

The EU had planned to include aviation within Europe and flights to and from Europe in the EU emission trading system (EU-ETS). The inclusion of international flights in the EU-ETS has been suspended until end of 2016, awaiting developments in ICAO. However, if ICAO is unable to agree on a global market-based-mechanism by this time, the EU will revert to its earlier plan to include all flights to Europe in the EU-ETS. Intra-European flights are part of EU-ETS, and revenue raised is included in the numbers presented in section 3.2.1.[21]

Shipping

In 2011, the International Maritime Organization (IMO) adopted global greenhouse gas emissions requirements for international shipping. These legally binding requirements are established as energy efficiency measures in Annex VI to the MARPOL Convention, and entered into force 1 January 2013. At the UNFCCC Climate Summit in Lima 2014, the IMO reported that it has been effectively addressing emissions from ships through steady improvements in shipping's energy efficiency (IMO, 2014).

The success of establishing energy efficiency requirements has resulted in several proposals for a market-based mechanism that have been put forward at the IMO though none have progressed. It is unclear when or if work on the development of market-based measures will resume, or whether it will include a possibility of raising revenue for international action.

Key messages

- Neither of the representative bodies for international aviation or shipping have reported significant progress on raising revenue for international climate action.
- Securing international agreement is the main barrier to implementation.

3.2.4 FINANCIAL TRANSACTION TAX

Description

A financial transaction tax (FTT) was originally defined as a tax on all spot conversions between currencies, but has lately been interpreted as a tax on financial transactions.[22] Revenue from an FTT would contribute to governments' budgets. Additional decisions, in accordance with the national budgetary rules, would be necessary to allocate some or all of it to climate finance in developing countries.

The AGF report estimated revenues from an international FTT to be between USD 2 and 27 billion in 2020. The tax rate is assumed to be very low, between 0.001 and 0.01 % of the traded volume.

21 Assuming a carbon price of EUR 6 these flights generate less than EUR 25 million on average per year in the period 2013–2020. 15 % of the total amount of allowances for aircraft operators is auctioned.

22 It is often referred to as a 'Tobin tax', since it was suggested by Nobel Laureate economist James Tobin.

State of play

There has been some implementation of FTTs at national and regional level since 2010, but there is no globally coordinated progress. Forty countries had an FTT in operation in 2011, raising EUR 29 billion. Most were industrialised countries, but India, Taiwan, Colombia and Peru are examples of developing countries that have introduced an FTT. In terms of G7 countries, Italy and France have introduced an FTT on purchases of equities, while the UK has a tax on documents related to the transfer of stock (Credit Suisse, 2013). EU Finance Ministers decided in 2012 that they could not reach unanimous agreement on an EU-wide FTT in the foreseeable future. Nonetheless, 11 EU member states have expressed a strong willingness to go ahead with an FTT. In January 2015, France and Austria argued for a "fresh start" for a lower rate FTT in the EU across a wider range of areas. Support for the tax in the EU has been motivated by the view that the financial sector should pay back at least part of what the European tax payers contributed to the bank rescue operations during the financial crises 2007-2010. The FTT examples are designed to generate revenues for earmarked purposes in EU member states, but there is no agreement on how this should be done.

France has often reiterated its commitment to spend a sizeable proportion of the revenue on international solidarity, climate change and the fight against epidemics (Euractiv, 2015; PwC, 2015). In 2012, France was the first European country to introduce a transaction tax on the purchase of shares. For French publicly traded companies with a market value over Euro 1 billion the FTT has levied a 0.2 % tax on stock purchases. In addition, the government introduced taxes on high frequency trading and on naked sovereign credit default swaps. The tax collected Euro 830 million in additional revenue for the government budget in 2014. The French government has committed USD 1 billion for the Green Climate Fund, which will be partially funded with revenues from the FTT.

Strong global coordination, allowing for international implementation, would increase the efficiency of FTT, limiting its distorting effects. The main barrier however to its global implementation is according to the AGF report lack of political acceptability and unresolved issues of incidence on developing countries.

Key messages

- France has demonstrated the potential of a national financial transaction tax (FTT) to raise money for international climate finance, as parts of their GCF commitment will be funded by revenues from their FTT.

- Limited political acceptability of such taxes and about directing proceeds to such specific purposes are significant hurdles preventing an FTT from becoming an additional source of international climate finance.

3.3 PRIVATE CAPITAL

Description

Global capital markets raise money from institutional investors, public, and private investors through various investment vehicles (equity, debt, and structured finance), thereby providing capital to governments, bilateral and multilateral DFIs, and multinational companies to direct toward low-carbon and climate resilient investments.

Private actors include commercial financial institutions; institutional investors; venture capital, private equity and infrastructure funds; corporate actors; and project developers, plus actors such as household end-users and philanthropy. These actors invest their savings directly in climate action. Alternately, their pooled savings held as pensions and insurance, or stocks and shares, may also be invested in climate actions on their behalf by institutional investors and commercial private actors. Philanthropic actors may also invest their significant resources motivated by environmental, social, and governance (ESG), and different investment models suggest that philanthropic capital could be a significant source of climate finance in the future.

State of play

The 2008 financial crisis and ensuing recession halted a three-decade expansion of global capital and banking markets. Today, growth has resumed, fuelled by expansion in developing economies but also by a USD 9.2 trillion increase in sovereign debt. The total value of the world's financial stock, comprising equity market capitalization and outstanding bonds and loans, increased from USD 175 trillion in 2008 to USD 225 trillion at the end of the second quarter of 2012, surpassing the previous 2007 peak. However, global financial assets have grown by just 1.9 % annually since the crisis, down from average annual growth of 7.9 % from 1990 to 2007 (Lund et al., 2013).

This slowdown is not confined to deleveraging advanced economies; surprisingly, it also extends to emerging markets. Private capital is examined in this report from a variety of angles. Institutional investors, who hold significant pools of this capital, were discussed in Section 2.4 'Developments in the Financial System and New Financial Products'. In Section 3.7, the role of private investors is considered, and a range of instruments and tools relevant for private capital are described (e.g. in Sections 3.8 on Green Bonds and 3.10 on Risk Mitigation). The potential to mobilise developed country private investors to contribute toward the USD 100 billion commitment is also discussed in terms of leveraging bilateral and multilateral DFI experience and toolkits (see Sections 3.5 and 3.6).

Key messages

- Despite steep devaluations of global capital following the economic recession, capital markets are a significant source of climate finance.

- The majority of private capital is invested within the country of origin. To be relevant to the USD 100 billion commitment, private investments need to be mobilised by developed country action.

- The potential magnitude of private sector contributions towards the USD 100 billion is impossible to assess accurately due to poor data and lack of agreed methodologies to calculate the mobilised private climate finance.

ACTORS

3.4 STATE ACTORS

Description

State actors determine how revenues will be raised to fund governments for the year or years ahead, and how scarce public resources will be distributed among a range of competing domestic and international priorities. Executive and legislative branches of government debate budgets and associated political priorities before they approve or reject spending proposals, such as proposals to contribute to international climate finance programs or funds that are relevant for the USD 100 billion commitment. The AGF did not consider the role of state actors as such. However it acknowledged that 'issues of political acceptability', or decisions to reallocate resources within domestic budgets to support international climate finance flows, could make implementation difficult.

State of play

In terms of their ability to contribute to the USD 100 billion climate finance comittment, strained public finances following the financial crisis and economic recession has increased pressure and scrutiny on state actors to ensure that public money is well spent. One route taken by state actors in their effort to increase international climate finance while managing resource constraints has been to leverage the skill sets and instruments of a broader set of public actors. National and bilateral public institutions, and multilateral agencies and financial institutions, have experience and toolkits that enhance the potential of public resources to have both scale and impact. These actors are explored in subsequent subsections on bilateral and multinational finance institutions, agencies and funds.

Key messages

- State actors' power to decide on allocation of public finance and implement policies puts them at the centre of the international climate finance system.
- Economic, policy, and political considerations can influence state actors' appetite to allocate domestic public budgets towards international climate finance.
- State actors could increase climate finance allocations by reallocating finance from within the existing tax base, expanding the tax base, or by raising debt.

3.5 BILATERAL AGENCIES AND DEVELOPMENT FINANCE INSTITUTIONS

Description

Bilateral development actors are public bilateral agencies, and development finance institutions (DFIs) based in developed countries. Bilateral agencies and DFIs are highly relevant to the USD 100 billion goal, as they directly channel finance to recipient countries (OECD, 2015c).

Bilateral agencies are government agencies and ministries which have overseas development mandates (e.g. GIZ – the German Federal Enterprise for International Cooperation, USAID – the United States Agency for International Development) and which provide mainly technical assistance based on grants. One of the roles of bilateral agencies in addressing climate change is to help build local governments' capacity to develop climate strategies and policies, and to mainstream climate change considerations into their existing development planning.

Bilateral DFIs are public financial institutions with development mandates (e.g. JICA – the Japan International Cooperation Agency, KfW – the German development bank), and mostly provide finance in the form of loans (90 %) and grants (10 %, see Buchner et al, 2014) to finance projects and programmes.

The AGF did not assess bilateral development finance as such, but considered 'direct budget contributions' in detail, a large part of which is channelled through bilateral agencies and DFIs. This section explains the specific role these actors play in providing targeted financial instruments, in line with the USD 100 billion climate finance commitment.

State of play

Bilateral agencies and DFIs contributed USD 26-27 billion to developed-to-developing country climate finance in 2013, including USD 22 billion of ODA flows (see *Table 1*).

Of the USD 22 billion of ODA in 2013, USD 11 billion was made as grants, USD 10 billion as loans, and USD 0.2 billion as equity investments (OECD, 2015d). In addition, developed countries reported USD 1 billion in 'other official flows' (OOF) committed for climate change in 2013 (OECD, 2014e). OOF refers to loans to developing countries that are not sufficiently concessional to be classified as ODA.[23] Combining ODA and OOF total bilateral official development finance (ODF) reached USD 23 billion (OECD, 2014e) in 2013.

Bilateral DFIs provide around half the value of bilateral development finance. Between them, the three largest bilateral DFIs (AFD – French Agency for Development, JICA and KfW) committed around USD 11 billion. The figure is probably even larger as they do not all report their OOF targeting climate change. Including these non-reported flows, estimates suggest that large bilateral DFIs (AFD, JICA, KfW, OPIC – Overseas Private Investment Corporation) channelled around USD 13–14 billion of developed to developing country climate finance in 2012 and 2013 (Buchner et al., 2013, 2014, based on DFI surveys and IDFC 2013, 2014), or USD 2–3 billion more than reported as official development assistance figures. These figures do not include finance from nine smaller European bilateral DFIs[24] which committed a further USD 1 billion of non-concessional climate finance in 2012 (Buchner et al., 2013, based on DFI surveys).

DFIs typically provide loans and use their balance sheets to raise debt on capital markets (mixed with government contributions in the case of concessional loans). Total bilateral DFI commitments can be split between government budget resources (grants, around 10 %), resources mobilised from raising debt on the capital market (non-concessional loans, around 20 %) and a mix of the two sources (concessional loans, around 70 %).[25]

A large part (around USD 12 billion) of bilateral ODA in 2013 was government grants provided to recipient governments, national funds or channelled through bilateral agencies.[26] Bilateral agencies mainly provide technical assistance and capacity building to support developing countries in

23 Other official flows are «transactions by the official sector with countries on the DAC List of ODA Recipients which do not meet the conditions for eligibility as Official Development Assistance, either because they are not primarily aimed at development, or because they have a grant element of less than 25 %» (OECD 2015a)

24 http://www.edfi.be/members.html

25 Buchner et al. (2014) estimate that 68 % of the USD 14 billion of climate finance committed by bilateral DFIs in 2013 are low-cost loans, 22 % are market-rate loans and 9 % grants.

26 Buchner et al. (2014) estimated that 80 % of bilateral ODA that is not channeled through DFIs is provided as grants.

Table 1: Climate finance provided and channelled by bilateral agencies and DFIs in 2013

FLOW	ESTIMATE FOR 2013	SOURCE
Bilateral ODA (almost equally split between grants and concessional loans)	USD 22 billion	OECD (2014f)
Bilateral OOF (non-concessional finance) reported to the OECD	USD 1 billion	OECD (2014f)
Additional non-concessional finance provided by large bilateral DFIs	USD 2 3 billion	Buchner et al. (2013, 2014), based on own surveys and IDFC (2013, 2014)
Additional non-concessional finance provided by smaller bilateral DFIs	USD 1 billion	Buchner et al. (2013), based on EDFI survey
Total	**USD 26–27 billion**	

achieving climate resilience and to develop national climate policies and action plans.[27] Many developing countries receive support from several programs for their climate change strategies and plans, including from multilateral programs (see Clapp et al., 2011). Therefore, close coordination among donors and recipient countries is needed.

Bilateral actors have developed and used a range of instruments and tools to leverage their own resources and mobilise further public and private finance for climate change mitigation and adaptation in developing countries. They can also help developing countries to overcome obstacles to providing public goods and services, can help to build private markets where they are not very developed, and can directly tackle costs and risks faced by private actors wanting to invest in developing countries through specific risk mitigation instruments (see Section 3.10). Some strong examples have now emerged that show how bilateral public climate finance can be targeted to specific needs, such as mainstreaming climate change adaptation into national planning and development co-operation (OECD, 2009) and building on long-term experience on development finance effectiveness (see OECD, 2008).

Bilateral agencies and DFIs could channel and mobilise even more climate finance to developing countries in the following ways:

- National governments could provide their bilateral agencies and DFIs with more resources
- Governments can provide additional equity or expand guarantee frameworks to bilateral DFIs to enhance their credit capacity.

27 See, for example, the US program on Enhancing Capacity for Low Emission Development Strategies (EC-LEDS 2015) or GIZ's contribution to the Climate Finance Readiness Program (BMZ, 2015) which aims to support developing countries to access the Green Climate Fund, and to mainstream climate change mitigation and adaptation considerations into sectoral development planning.

- Bilateral DFIs that do not or only partly rely on government budget contributions could expand climate change commitments, using their own balance sheets.

- Bilateral agencies and DFIs could change their instrument mix to drive more private investment, for example, by increasing their use of guarantees, and structured investment funds.

- Governments could call for further mainstreaming of change action into sectoral programmes and projects. For instance, the United States government has committed to incorporate climate resilience into all its international development operations (White House, 2014).

- Regular monitoring and evaluation can ensure that public funding is not crowding out private investment but rather crowding in private resources and expertise in ways that deliver economies of scale and efficiencies.

Key messages

- In 2013, both bilateral agencies and DFIs provided and channelled around USD 26–27 billion of climate finance to developing countries, almost 50 % of which targeted adaptation. Grants made up USD 11 billion of this total and were provided largely by bilateral agencies.

- Both bilateral agencies and DFIs have the potential to channel more public climate finance by mainstreaming climate change considerations across all operations and investments. They could mobilise more private investment by scaling up and replicating successful interventions.

- They play multiple functions beyond funding and implementing projects, including acting as technical experts, trustees, and implementing partners to governments, other national and international organisations, and non-governmental organisations.

3.6 MULTILATERAL DEVELOPMENT BANKS AND CLIMATE FUNDS

Description

Multilateral institutions and organisations consist of multilateral development banks (MDBs),[28] multilateral climate funds (MCFs) and other multilateral organizations.[29] MDBs are public financial institutions whose development mandates include climate change. They use equity capital from different governments to raise debt on the capital markets to finance interventions in developing countries. MCFs, such as the Climate Investment Funds (CIF) and the Green Climate Fund (GCF), are financial vehicles that pool government contributions and then disburse them to support mitigation and adaptation purposes. They often use MDBs or United Nations (UN) agencies as implementing entities, but an increasing share of MCF finance is also channelled through national implementing entities. Multilateral institutions and organisations pool financial contributions (equity capital, grants, loans) from different

28 For example the African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, International Finance Corporation, World Bank.

29 E.g. UN agencies, such as UNDP or UNEP that are relevant as implementing entities of multilateral climate funds. We are not discussing such other multilateral organizations separately.

developed and developing country governments and disburse finance at the discretion of the agency in question (OECD, 2015c).

The AGF concluded that MDBs could be an important channel of climate finance to developing countries and could play a significant multiplier role catalysing private finance, given their ability to leverage their balance sheets, blend public and private instruments, as well as their track record with risk mitigation instruments, technical assistance and carbon markets. The AGF also noted that international financial institutions could help drive financial innovation for climate investment. The AGF calculated that if USD 10 billion of additional finance were channelled through the MDBs, they could mobilise at least USD 30–40 billion in MDB grants and loans. In the long term, loan repayments could also be used to fund additional MDB lending for climate change.

The European Commission (2011) proposed that multilateral and other development banks should broaden their sources of climate finance, and have substantial leverage through financing and technical assistance. The World Bank et al. (2011) saw 'limited' current headroom for MDBs to greatly expand climate financing on their own balance sheets[30] but 'significant' opportunities for MDBs to mobilise resources through pooled financing arrangements (including multilateral climate funds).

State of play

Multilateral development banks

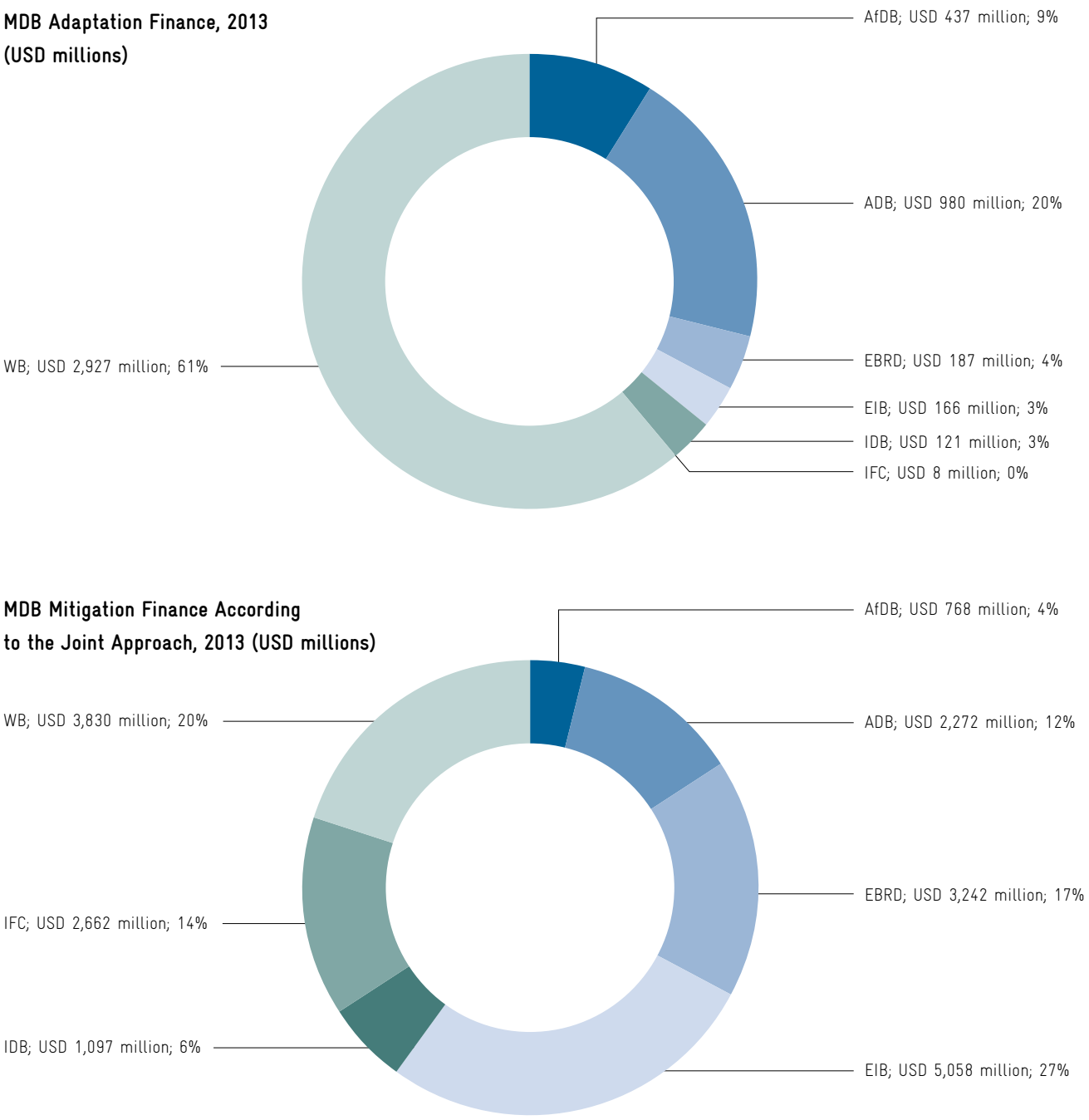
According to their joint tracking approach (see below), MDBs committed between USD 21.6 and 24.7 billion of MDB resources[31] to climate finance in developing, and emerging countries annually between 2011 to 2013 (AfDB et al., 2012a, 2012b, 2013, 2014). This funding is enabled by national governments: based on paid-in capital from governments, MDBs raise debt on capital markets and provide commercial loans, and based on concessional finance from government budgets they provide grants and concessional loans, which together reached USD 5 billion in 2013 (Buchner et al., 2014). MDBs committed another USD 1.5–2.2 billion of external resources received from bilateral or multilateral donors and funds, including the Global Environment Facility and the Climate Investment Funds. This USD 1.5–2.2 billion was not additional to the contributions of national governments discussed in 3.1. There is no agreed methodology to attribute MDB climate finance commitments to different governments, developed or developing.[32]

30 According to World Bank et al. (2011), existing headroom disappeared as MDBs undertook increased lending in times of the financial crisis, which stretched their balance sheets. To avoid a contraction in post-crisis lending, MDB capital was replenished but not to an extent that created room for more climate finance. Only the IDB linked the capital increase in 2010 to the target to increase lending for climate change, sustainable energy and environmental sustainability to 25 % by 2015.

31 MDB resources include equity capital from governments, debt raised on capital markets (e.g. through green bonds) and government contributions to core MDB funds (e.g. African Development Fund, IDB Special Fund, IDA).

32 There are three options in the literature: multiplying a country's multilateral ODA contribution to organisation Y with organisation Y's share of the portfolio addressing climate (OECD 2015c), multiplying MDB climate finance commitments with country share of subscribed capital (Buchner et al. 2014), attribution of all MDB climate finance to industrialised countries, given that they hold the majority of MDB capital (Buchner et al., 2014).

Figure 5: MDBs providing finance to adaptation and mitigation in 2013



Note: Numbers presented are based on the MDB joint approach for climate finance tracking; some MDBs use another approach for their own numbers (AfDB et al., 2014).

MDBs do not report the share of instruments used to deliver climate finance in their joint reports but reporting to the OECD (2015d) and Buchner et al. (2014) suggest that more than 90 % of MDB finance is provided as loans, while grants make up less than 5 %.[33]

MDB adaptation finance (own and external resources) reached USD 5 billion in 2013, with the World Bank providing the majority of commitments (see *Figure 5*). MDB mitigation finance reached USD 19 billion in the same period, with the value of commitments more evenly distributed among different MDBs (see *Figure 5*). Adaptation finance was mostly spent on energy, transport, and other built environment infrastructure (30 %), coastal & riverine infrastructure (22 %) and agricultural & ecological resources (20 %); while mitigation finance was mainly spent on renewable energy (25 %), energy efficiency (23 %) and transport (22 %) and energy efficiency and renewable energy financing through financial intermediaries (15 %).[34]

MDBs have an important role in mobilising public and private investments in developing countries, given their wide range of available tools and instruments (see Section 3.10 on risk mitigation). However, in some cases MDBs, like DFIs, can crowd out rather than mobilise private sector lending or investment. Careful design of their investment mandates and strategies to suit particular markets and contexts can minimise this risk (Buchner et al., 2014).

MDBs have also taken other steps to encourage climate-friendly operations, including by developing a joint climate finance tracking approach, and the commitment of several MDBs (World Bank, EIB and EBRD) to limit financing of coal plants to 'rare' cases (Bloomberg, 2013). Climate finance reached 18 % of MDB commitments in 2013 (AfDB et al., 2014).

Multilateral climate funds

The most prominent multilateral climate funds (MCFs) are the Green Climate Fund, the Climate Investment Funds, the Adaptation Fund, the Least Developed Countries Fund, the Special Climate Change Fund and the climate-related share of the GEF Trust Fund. MCFs play a limited but increasing role in climate finance, with yearly allocations rising from around USD 1.5 billion in 2011 to around USD 2 billion in 2013 (Buchner et al.,2014). According to preliminary numbers for 2014, climate fund allocations have dropped to around USD 1.5 billion.[35] In 2014, initial pledges for the new multilateral Green Climate Fund (see Section 2) under the UN reached more than the USD 10 billion (for a multi-year funding period), meaning multilateral climate funds will become even more important channels towards the end of 2015 when the first GCF finance allocations are planned (GCF, 2015). MDBs currently provide administrative, trustee and/or implementation services to all relevant multilateral climate funds

33 Of the USD 10.7 billion MDB climate finance commitments in 2013 that were reported to the OECD and for which project level-data is publicly available (OECD 2014b), USD 4.8 billion (or 45 %) were classified as non-concessional loans, USD 1.8 billion (or 17 %) as concessional loans, USD 0.3 million (or 3 %) as grants and for USD 3.7 billion of 35 % the instrument was not indicated. Of the USD 40.1 billion MDB climate finance commitments in 2013 captured in Buchner et al. (2014), which includes interventions in developed countries, USD 34.3 billion (or 85 %) were classified as market-rate loans, USD 4.6 billion (or 12 %) as low-cost loans , USD 0.56 million (or 1 %) as grants, and USD 0.65 billion as equity (2 %).

34 See AfDB et al. (2014)

35 Using preliminary numbers from http://www.climatefundsupdate.org/data (9th April 2015) and assuming same allocations of Multilateral Fund under the Montreal Protocol as in the year 2013.

Box 1: Public institutions' financial tool-box to mobilise private investment

Non-concessional loans to finance projects where access to (long-term) finance is a key barrier, see e.g. the case of IDB credit lines for energy efficiency in Mexico (Micale et al., 2015 forthcoming) and AFD credit lines for renewable energy and energy efficiency in South Africa.

Concessional loans where climate-friendly technologies are too expensive for local governments but contribute to global public goods (climate change, technology cost reductions), see e.g. the case of Concentrated Solar Power (CSP) plants in Morocco where syndication of loans from several multilateral DFIs enabled the financing of a 100 MW plant (Falconer and Frisari, 2012).

Risk mitigation instruments covering specific risks the private sector cannot bear include equity investments (Cochran et al., 2014), guarantees (Mirabile et al., 2013), insurance (e.g. African Risk Capacity (ARC, 2015) where capital from bilateral actors and re-insurance enables the provision of parametric index-based drought insurance), structured funds (e.g. the UK's Climate Public Private Partnership Funds or the Global Climate Partnership Fund (GCPF, 2015) where the public sector invests in the high risk tranches and thereby mobilises institutional investors in the senior tranche) or project preparation facilities (see Miyamoto and Biousse, 2014 for an overview).

Public-private fund of funds that can leverage substantial private investment. Examples include: the EIB-managed Global Energy Efficiency and Renewable Energy Fund (GEEREF) that invests in private equity funds which focus on clean energy projects in emerging markets; and two MDB-managed funds (the International Finance Corporation (IFC) Catalyst Fund, and Asia Climate Partners) under the United Kingdom's (UK) Climate Public Private Partnership (CP3) where the UK is investing £ 110 m as an anchor investor in two private equity funds.

Technical assistance for project and business development, e.g. the Seed Capital Assistance Facility a UNEP-MDB initiative (SCAF, 2015) providing enterprise development support and seed capital for clean energy or the Global Infrastructure Facility of the World Bank Group that will facilitate the preparation and structuring of complex public-private infrastructure projects to mobilise private and institutional investor capital (World Bank Group 2015).

Technical assistance to support the creation of enabling environments for investment, including by removing fossil fuel subsidies and setting up carbon pricing (e.g. through the World Bank-managed Partnership for Market Readiness that is supporting countries in setting up emission trading and carbon taxes, or the new Carbon Pricing Leadership Coalition founded in 2014).

Results-based financing and aid, to pay for actual development or climate result achieved, thereby increasing revenues for public and private investments in climate change. DFIs have substantial experience with result-based financing from the carbon market (CDM, REDD+) and the Output-Based Aid (OBA) programs. The World Bank has recently set up a Pilot Auction Facility for Methane and Climate Mitigation and is also exploring result-based financing and aid in the context of energy policies and projects (see e.g. ESMAP 2013, 2015)

Approaches combining capacity building , financing and subsidies, e.g. the Uganda GET FiT program under which bilateral donors provided technical support to set up a feed-in-tariff (FiT), a top up on the FiT, and financing for grid connection (Rieger, 2015), or the solar-water heater program 'Prosol' in Tunisia where interest-rate subsidies increased returns and technical assistance provided a basis of a decision by the state utility to act as debt collector guarantor and enforcer, thereby reducing credit risks for local banks (Trabacchi et al., 2012).

MCFs add value compared to other bilateral and multilateral channels: they can help to pool concessional resources from different donors dedicated to climate change, deploy concessional finance blended with less concessional finance or guarantees from implementing entities, fill sectoral and geographical gaps, and ensure that all developing countries have access to climate finance (directly or via multilateral institutions). Multilateral climate funds also make use of the technical capacity of multilateral development banks and agencies, while keeping governance with contributor and recipient governments, which is an attractive model particularly for smaller donors.

Key messages

- Multilateral Development Banks (MDBs) committed USD 21.6–24.7 billion per year to international climate finance in 2011–2013, both to developed and developing countries mainly provided as loans with four times more finance going to mitigation than adaptation.

- Multilateral climate funds flows to developing countries reached USD 2 billion in 2013 and they will have more resources in the future as the Green Climate Fund (GCF) becomes operational.

- MDBs play multiple functions beyond funding and implementing projects, and act as technical experts, trustees, and implementing partners to governments, other national and international organisations, and non-government organisations.

- MDBs and multilateral climate funds have the potential to channel more public climate finance and to mainstream climate change considerations across all operations and investments. They could mobilise more private investment by scaling up and replicating successful interventions.

3.7 PRIVATE INVESTORS

Description

In 2010, the AGF limited its consideration of sources of private capital to private investment in developing countries that originates in, and is mobilised by specific developed country interventions. The AGF estimated that USD 100–200 billion of mobilised private finance could flow from developed to developing countries in 2020 assuming that: around 50 % of total private investments in developing countries were of international origin; there was a global carbon price of USD 25 per tonne; and USD 30–60 billion of international public finance targeted private mobilization. Domestic private flows in developing countries were not explored.

State of play

Private investors contribute the majority of global climate investment flows – approximately USD 193 billion in 2013, regardless of whether this is mobilised or not (Buchner et al., 2014). However, few if any of the original AGF assumptions have come to pass. Since 2010, our understanding of private actors' roles and behaviour related to climate finance has improved. The domestic bias of private investors everywhere has become clearer, highlighting their strong preference for familiar and predictable enabling environments (Buchner et al., 2013, 2014) that provide appropriate support (see 'Domestic Policy and Enabling Environments in Section 2). For instance, 90 % of global private investment in renewable energy took place domestically in 2013 (Buchner et. al, 2014). Better understanding of the risks these and other investors face, and the emerging options to address these through risk mitigation instruments provided by public institutions provides a way to increase this source of climate finance in the future (see section 3.10 on Risk Mitigation).

Still it is difficult to estimate the full potential of private investors to contribute toward the USD 100 billion climate finance goal. Most available private climate finance data tracks renewable energy investments. Detailed information about private investments in energy efficiency and climate resilience is rarely disclosed at the project level. There also no agreement about methodologies used to calculate climate finance – for example whether to calculate gross investment flows or only 'mobilised' or 'net' climate finance or how to calculate 'finance mobilization' (Buchner et al., 2014). In addition, there is no agreement about whether domestic private flows should count if mobilised by developed country action. These challenges limit our understanding of the potential of private climate finance flows and must be acknowledged.

Climate finance flows captured in the relevant literature show that USD 2 billion in renewable energy project investments flowed directly from private investors in OECD countries to developing countries in 2013 (Buchner et al., 2014).[36] This estimate excludes Foreign Direct Investment (FDI), and is a very conservative, lower-bound value. Using fDi Intelligence (2014) data, Buchner et al. (2014) estimate foreign direct investment (FDI) in renewable energy from developed to developing countries in 2013 reached USD 12 billion.[37] Considering a broader range of investments, Stadelmann et al. (2013) estimated USD 10 to 37 billion of FDI flowed from developed country private investors to developing countries from 2008-2011.[38] While estimates of total private finance flows already have a wide range, figures for mobilised private climate finance are even more variable. Initial estimates by Stadelmann et al for example included lower and the upper bound estimates that varied by 500 %. A major reason for this is that data on private co-financing mobilised by public finance have not yet been aggregated in a standardized form by DFIs and MDBs.

There are opportunities to target further international and domestic private sector investment as an engine of low-carbon, climate-resilient, socially inclusive growth, for instance, by supporting the development of domestic enabling environments that mitigate risks and improve returns for international private actors. Developed countries are increasingly aware of the importance of these enabling environments and there is much that developed-country-backed public finance and technical assistance can do to support better enabling environments in developing countries. Some examples include:

- EU REDD program which aims to address the underlying economic drivers of deforestation
- Low-emission capacity building programme (LECB) which assists developing countries in refining low-carbon, climate resilient development strategies
- Partnership for Market Readiness (PMR) which supports exploration of emissions-reduction approaches through market instruments (e.g., carbon markets) (ITA, 2014)

36 The Bloomberg New Energy Finance (BNEF) database categorises flows as coming from a developed country if they originate with a company or entity headquartered in an OECD country.

37 This estimate assumes the same split between developed and developing countries for FDI in renewable energy as for all FDI. The FDI estimate cannot be added to the USD 2 billion of developed to developing country project-level finance, as most FDI flows to manufacturing or companies that invest in renewable energy projects, so counting both FDI and project-level finance would, very likely result in double counting the same pools of finance (Buchner et al., 2014).

38 Figures include estimates from UNCTAD (2010), of FDI flows in renewable energy (lower bound of figure) and recycling/environmental technology manufacturing (upper bound) invested in developing countries, deducting estimates of South-South flows. UNCTAD (2010) used investment-level data from fDi Intelligence.

This section considers (1) commercial actors and (2) personal actors. Commercial actors[39] include project developers; corporate actors & manufacturers; commercial financial institutions (CFIs); institutional investors; and private equity, venture capital, & infrastructure funds. Personal actors include households making investments in renewable energy, energy efficiency, sustainable transport, and climate resilience etc. for personal use or benefit.[40] Personal actors also include philanthropic actors including foundations, endowments, single-and multi-family offices, ultra-high net worth (UHNW) individuals and their intermediaries, who can allocate capital towards climate finance in developing countries both through direct contributions, and indirectly through their investments.

Commercial Actors

Commercial actors are by far the largest global investors in renewable energy. Of the USD 2 billion tracked in developed-developing country renewable energy financing flows, almost all came from traditional commercial actors like project developers (e.g. SunEdison), corporate actors (e.g. IKEA), and commercial financial institutions (e.g. Banco Santander) (Buchner et al., 2014).

Multinational and parent company commercial private actors also have strong incentives for making energy efficiency investments, both to reduce their energy bills and potentially to comply with building codes, but these investments are difficult to track accurately. Available energy efficiency estimates tend to be rough aggregates as the financial details of projects designed to reduce energy use in buildings and industry, the savings generated, and other relevant details are rarely disclosed publicly. The degree to which private investments in energy efficiency in developing countries originate in developed ones is unknown, much less the amount of finance 'mobilised' by developed country interventions. Estimates of commercial actors' energy efficiency financing are complicated by conflicting accounting methods – some designed to estimate incremental investment versus business-as-usual technologies (IEA, 2014), and others that look at the full costs of the underlying building investments (HSBC, 2014). The difficulties in tracking and estimating energy efficiency finance are generally more pronounced in developing countries. In addition, there is no reliable baseline estimate for the amount of developed-to-developing country energy efficiency financing against which to measure progress.

Since 2010, multinational private investors have shown increasing interest in improving their climate-resilience. Such actions can have strong development gains for developing countries and local supply chains. The agricultural sector provides an example of the potential of climate-resilience for private investors. Globally, 70 % of the world's poorest depend on agriculture for their livelihoods, making them highly vulnerable to climate impacts on crop yields (WB, 2015). International agriculture businesses that buy from these growers are also vulnerable to the climate impacts that disrupt and add risk to their supply chains. Public-private partnerships such as the Agricultural Supply Chain Adaptation Facility being developed under The Global Innovation Lab for Climate Finance can help boost supply chain productivity and reduce climate-related risk, which is a benefit to growers and buyers alike. This alignment also helps encourage much-needed private investment by developed country actors in developing country climate resilience outcomes (Trabacchi et al., 2013; Trabacchi et al., 2014; Trabacchi et al., 2015 forthcoming).

39 Relies on the same definitions of private actors as Buchner et al. 2014 but breaks households into a separate sub-category

40 Reliable data is only available on their household's renewable energy investments due to the aforementioned data limitations.

Systems to track multinational private investment in climate resilience have not yet been established due to the breadth and complexity of possible adaptation investments across countries, economic sectors, and private actors, and the lack of agreement on what constitutes adaptation (Jones et al., 2012). For instance, public-private projects to upgrade energy and water infrastructure can reduce emissions and operating costs for developing countries and can boost system and resource reliability during extreme weather events. In these and other large-scale private sector investments in mitigation and economic development, it is difficult to isolate the part of the original investments that builds climate-resilience.

Households

Households are an almost exclusively domestic source of private climate finance. In 2013, households invested USD 34 billion in solar PV and solar water heaters. Since 2010, examples have emerged of international/domestic public partnerships that have successfully targeted consumer demand in developing countries to drive investment in domestic renewable energy technologies and away from fossil powered alternatives (Trabacchi et al., 2012).

Philanthropy

Since 2010, recognition has grown that philanthropic capital can contribute to private flows from developed to developing countries. At present, there are no reliable estimates of the amount of philanthropic capital devoted to climate finance. Nonetheless, the significant growth of environmental, social, and governance (ESG) and different investment models suggest that philanthropic capital could be a significant source of climate finance in the future.

High net worth individuals and families, private foundations and endowments have a range of investment choices, from pure philanthropy (donations), to impact investment (both financial and environmental returns), to classic investing (market-rate returns). Philanthropic capital is often not mobilised by the public interventions of a developed country, but it has the capacity to "act" like public finance – by taking on levels of risk and/or accepting rates and timelines of return that the conventional private sector will not.

Key messages

- Data limitations, confidentiality and methodological issues prevent a comprehensive picture of private climate investment that may contribute to the USD 100 billion goal. Current estimates vary significantly, and are not comparable.

- Lack of familiar, stable policy environments impedes private investment. Developed country public finance and technical assistance can help developing countries to establish enabling environments in that mitigate risks, improve incentives, and boost returns for international and domestic private investors.

INSTRUMENTS

3.8 GREEN BONDS

Description

Green bonds are debt instruments to channel investments into green or climate change assets and activities. They are a relatively new form of bond, an existing instrument, and were not specifically covered in the original AGF report. Part of their appeal lies in their attraction for institutional investors such as pension funds, a potentially significant source of investment in climate-relevant projects. For instance, following the UN Climate Summit in 2014, institutional investors[41] pledged to invest over USD 5 billion in green bonds (CBI, 2014b; Robinson-Tillett, 2015) (see also discussion of institutional investors in Section 2).

State of play

The labelled[42] green bond market has experienced rapid growth particularly in the last two years and has the potential to grow hugely in future. The total outstanding value of the green bond market reached USD 53.6 billion in 2014 (CBI, 2014a and 2014b). Yet to put this rapid growth in context, labelled green bonds account for less than a fraction of one percent of the total global bond market, which is estimated at approximately USD 100 trillion (Kato et al., 2014; OECD, 2015).

Approximately 75 % of green bonds have been issued by government-owned or -backed agencies and development finance institutions at the multi-national, national or municipal level primarily in developed countries, including by entities in Canada, China, France, Germany, the US and UK, and multilateral development banks (CBI, 2014a). However, an increasing number are also being issued by private institutions (e.g. commercial banks and corporations) and more institutions in developing countries could soon follow suit.

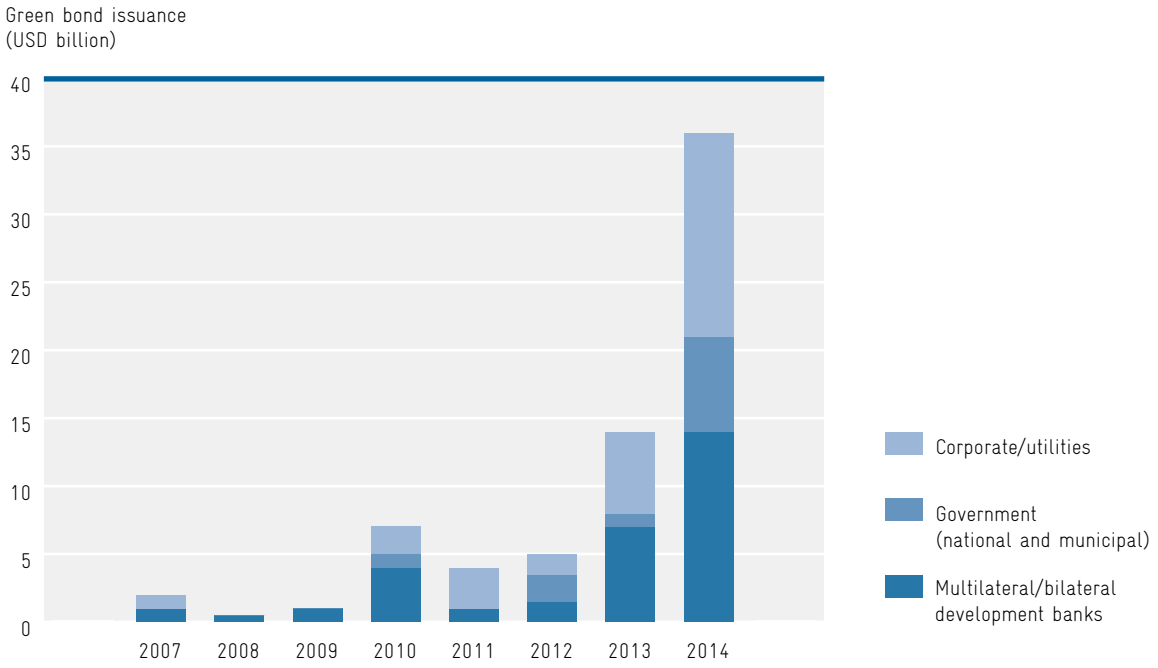
A significant share of green bonds finances climate projects in developing countries. Green bonds issued by multilateral and bilateral development finance institutions have raised approximately USD 30 billion cumulatively since 2007, or approximately 43 % of the green bond market, growing from USD 4 billion in 2010 to USD 14 billion in 2014. Part of the money raised has been lent to projects in developing countries (see Figure 6).

The World Bank and the European Investment Bank were early issuers of green bonds to target climate activities in developing countries, driven by demand from public pension fund investors. Bilateral development agencies such as KfW and export credit agencies, such as Export Development Canada, have also issued green bonds for similar purposes.

41 ACTIAM, Barclays Bank, Deutsche Bank, and Zurich Insurance Group

42 Labelled green bonds are identified as green by the issuer but different issuers' definitions of eligible project types vary and while the environmental quality of some bonds is independently reviewed others are not. There are also bonds that may finance climate action but have not been labelled or identified specifically by the issuer as green, but they are not the focus of this section.

Figure 6: Green bonds by issuer type



Sources: Compiled from BNEF (2014), CBI (2014a), CBI (2015), World Bank (2015)

Note: Data overlaps with climate finance reported from multilateral and bilateral development banks.

Developing country institutions could also attract international investment through green bonds. One example is the Korean Export Import Bank's (Kexim) bond issued in US dollars, which attracted investors primarily located in the US (47 %) and Europe (32 %) (Wee, 2013). The city of Johannesburg, South Africa, and the commercial Yes Bank of India have also issued green bonds and IFC is considering investing in the latter. However, the degree to which most bonds issued by developing countries could attract international investors is unknown.

Many of the public and private investors in multilateral development bank green bonds are likely based in developed countries but data is very patchy. Publicly available data only exists for a fraction of their bond holders since many fall outside of regions such as the US and EU that require disclosure, and many green bonds trade in secondary markets making it more difficult to identify investors (BNEF, 2014).

Governments and development finance institutions could also attract more private investment in green bonds by reducing risks related to e.g. currency fluctuation, political risk, and credit risk by providing insurance (e.g. see Section 3.10 on risk mitigation). The Green Climate Fund could also play a role in this regard.

Green bonds have been used to finance both mitigation and adaptation projects, but the majority have focused on mitigation, particularly on renewable energy (BNEF, 2014). Some municipalities in developed countries have included both mitigation and adaptation components in their green

bonds, with water management a common focus. Some green bonds also include consideration of other environmental issues, such as water conservation or biodiversity.[43]

There are some open questions on green bonds as a source of climate finance. First, do they raise new financing for climate action or just re-package existing financial products? Issuing green bonds can attract new investors focused on sustainable or responsible investing (World Bank, 2015) but in this initial stage of the market, most green bonds are used as a re-financing tool, re-packaging projects that could have been financed through a standard bond. That said, if the underlying projects are low-carbon, then this could increase investor confidence in the market and eventually lead to an increased number of new green projects that could be targeted with green bond financing (CBI, 2014a).

Secondly, are definitions clear enough and is there enough transparency for green bonds to be scaled up? At present, there is no agreed definition or standard for what types of projects can be financed by a green bond and approximately 40 % of the current green bond market has not undergone an independent review of its green label (CBI, 2014a). Of the remaining 60 %, reviews vary between identification of climate impacts, social impacts as well as cash-flow accounting of bond proceeds.

Investors and other financial stakeholders are starting to pay more attention to the environmental integrity of green bonds. The Green Bond Principles (ICMA, 2015) document, signed by many stakeholders in the green bonds market, outlines voluntary guidance for issuing green bonds, focusing on delineated accounting and transparency but does little to define what green project types should be eligible. Over 25 investors, including some of the largest institutional investors, signed a Statement of Investor Expectations for the Green Bond Market (Ceres, 2015). The statement goes further than the Green Bond Principles. Signatory investors will carry out additional due diligence when evaluating bonds that finance projects whose environmental benefits are marginal. The statement also notes the expectation of annual impact reporting and the need for independent assurance or auditing on the selection and tracking of green projects.

Key messages

- The green bond markets have grown rapidly in recent years but questions remain as to what degree green bonds raise new climate finance or just re-package existing financial products. In addition, definitional questions on what constitutes a green bond will need to be addressed if this instrument is to contribute meaningfully to climate finance.

- Data limitations prevent a comprehensive assessment of green bonds' potential contribution to the USD 100 billion. To be relevant to the USD 100 billion commitment, green bonds need to be mobilised by developed country action.

43 Catastrophe or "cat" bonds are an indirectly related financial instrument with limited direct links to climate benefits and thus are not the focus of this section. Cat bonds are issued by insurance companies to mitigate the risk of extreme weather events, and payments depend on the non-occurrence of specific weather events. Yet linking specific extreme weather events to climate change trends is not straight-forward, and cat bonds do not necessarily provide incentives for financing a climate-resilient future (CBI, 2013).

3.9 DEBT FOR CLIMATE SWAPS

Description

'Debt-for-nature' swaps give debt relief in exchange for nature conservation or environmental protection efforts. By adjusting its focus, a swap could provide finance for climate change mitigation and adaptation actions in developing countries (Fenton et al., 2014). A 'debt-for-climate' swap would not necessarily make more resources available to a government (especially for highly indebted countries), but a properly designed swap may create a 'fiscal space' allowing the government to mobilise more domestic savings for climate-related investments (Cassimon and Essers, 2011). There is some risk of moral hazard in terms of debtor countries being less willing to repay debt in the anticipation of a debt swap arrangement.

The idea of debt for climate swaps in not new, but has only provided small amounts of money so far. Therefore, the AGF report did not consider 'debt-for-nature' nor 'debt-for-climate' swaps.

State of play

Long-term bilateral debt held by developing countries amounted to USD 345 billion in 2012. Debt relief has been applied by a number of G7 countries. The US provided USD 32 million of its fast-start finance commitments via a 'debt-for-nature' swap under its Tropical Forest Conservation Act (Fenton et al., 2014). Italy fulfilled USD 50 million of its fast-start finance commitments via 'debt-for-nature' swaps in Vietnam, Ecuador and the Philippines. This year Seychelles signed a debt for climate swaps deal worth USD 30 million with the Paris Club creditor group and South Africa (Paris Club, 2015). This will fund an initiative for marine conservation and adaptation to climate change, while simultaneously reducing Seychelles' foreign-currency debt.

In the context of climate finance sources these are small amounts. Other creditor countries that have made 'debt-for-development' swaps include EU states, Canada, Norway, Russia, and Switzerland. Fenton et al. (2014) estimate that 'debt-for-climate' swaps on debt owed by developing to industrialised countries could contribute some USD 30 billion of climate finance per year.[44]

The Commonwealth has made a proposal for a multilateral debt relief-for-climate swap mechanism. For the Commonwealth small states Mitchell (2015) estimates that the proposal could translate into USD 0.4 mill to USD 277 mill of debt service ring-fenced for climate projects annually, equivalent to USD 6 mill to USD 4.2 bill over the 10–15 years life of the debt swap (based on 2012 data and assuming a 100 % write down of multilateral concessional debt stock).

Key messages

- There are first experiences of using 'debt-for-climate' swaps for fast start finance. Being a new area for implementation, a number of challenges have to be overcome in their design and implementation.

- 'Debt-for-climate' arrangements which provide debt relief in return for climate action could be a politically feasible option for some countries to contribute climate finance to developing countries.

44 Cassimon and Essers (2011) estimate that debt available for conversion through swaps is much higher – USD 236 billion as of end of 2009, but mention that the actual amount might be significantly lower due to many limitations and complexities.

3.10 CARBON MARKET OFFSETS

Description

A carbon offset is a reduction in emissions of CO_2 or GHGs made in order to compensate for an emission made elsewhere. Carbon offsets, such as units from the Clean Development Mechanism (CDM), are bought in order to comply with caps in emission trading systems on the total amount of carbon dioxide they are allowed to emit. The international market for carbon offsets exists to enable compliance with caps on the total amount of carbon dioxide they are allowed to emit under emission trading systems such as the Kyoto Protocol or domestic emission trading systems.

There are different views on carbon market offsets (AGF, 2010). Some see the primary objective of these instruments as reducing the cost of mitigation in developed countries and argue that they should therefore not be counted towards the USD 100 billion commitment. Others think offsets should be counted towards this goal because they regard these payments as a clear example of policy-driven financial transfers to developing countries and because offsets have demonstrated success in predictably and efficiently leveraging additional investment in developing countries.

With this caveat, in the AGF report, carbon offsets were expected to reach USD 30-50 billion by 2020. The AGF report based its estimates for this source on the purchases of offsets in developing countries. According to the AGF report carbon markets offer important opportunities for directly financing new technologies in developing countries, and for leveraging private investments. The G20 paper indicated the potential, across a range of carbon pricing scenarios, to be USD 20–100 billion, with a higher upside than in the AGF report (WB, 2011).

State of play

In the last nine years, CDM has reduced or avoided more than 1.5 Gt of CO_2 equivalent, and the total investment in CDM projects is estimated to have raised at least USD 138 billion of finance for mitigation activities in developing countries, probably significantly more (CDM Executive Board, 2014). By the end of 2011, the revenue generated by the sale of offsets, was estimated to be at least USD 9.5 billion and possibly as much as USD 13.5 billion (UNFCCC 2012). The offsets issued since then (750 million) have generated less than USD 1 billion due to the low prices of in subsequent years.[45]

The CDM has facilitated cross border flows, but carbon offsets need not be cross border or North-South. Approximately 90 % of investments in CDM projects are being domestically financed (UNFCCC 2012). CDM has also provided a share of its proceeds to the Adaptation Fund, generating revenues of USD 190 million (Adaptation Fund Board, 2014).

Voluntary buyers of offsets have directly funded 844 Mt of CO_2 equivalent in emissions reductions worth USD 4 billion (Forest Trends' Ecosystem Marketplace, 2014). The voluntary market for offsets has been relatively stable for several years at around USD 0.5 billion (0.4 billion in 2013). More than 90 % of buyers are in Europe, North America and Australia. The private sector – motivated by growing concerns over climate change – has provided the largest source of demand (three-quarters). National and sub-national governments and multi-lateral public agencies are now playing a new and important role in the market. These actors supplied 15 % of transacted offsets as project

45 Assuming CER prices of EUR 2.5 in 2012, EUR 0.43 in 2013 and EUR 0.6 in 2014 (Thomson Reuters Point Carbon, 2015).

developer and bought another 19 % of all offsets purchased or financed in 2013 (Forest Trend's Ecosystems Marketplace, 2014).

Despite the positive lessons learned the outlook for international carbon market offsets in general is rather grim. CDM grew impressively from 2006 to 2012 before going into sharp decline. According to the CDM Board the main cause of this decline is reduced demand rather than the mechanism itself. Falling carbon prices and new import restrictions imposed by national and regional emission trading systems have caused the carbon market offsets price to drop from EUR 5–10 in 2010 to below EUR 1 today (CDM Executive Board, 2014). This current price is far below the projections made in the AGF report.

Although the Regional Greenhouse Gas Initiative (RGGI) program allows for offsets, none have been developed to comply with the program because the allowance price is too low to make project development economical. In California, only domestic offsets are allowed.

During the first crediting period the CDM demonstrated the ability to attract investments in developing countries on a large scale. This experience provides evidence that results-based payments can stimulate project-development on the ground and engage foreign and domestic private sector actors in climate change mitigation in developing countries.

Key messages

- Due to lack of demand, the carbon offsets market is preforming far below the projections made in the AGF report.
- The future of the international offset market is dependent upon international climate agreement.
- International agreement on whether offsets are classified as mitigation or finance instruments would determine whether they could be counted towards the USD 100 billion commitment.

3.11 RISK MITIGATION MEASURES

Description

Publicly-backed institutions, such as bilateral and multilateral development finance institutions (DFIs), Export Credit Agencies (ECAs) and National Development Banks (NDBs) issue risk mitigation instruments, such as guarantees and insurance. These instruments can change the risk and return profiles of particular investments and unlock private finance for low-carbon and climate-resilient projects in developing countries. The 2010 AGF Report considered risk mitigation and revenue-enhancing instruments among the specific interventions used by developed countries' public actors and, particularly, multilateral development banks, to stimulate international private flows.

State of play

Since 2010, the risks associated with climate finance investments have changed. Over the last five years most renewable energy technologies, especially solar PV, have become increasingly reliable and cost competitive and technical risks are lower (IRENA, 2014).Understanding of how risks constrain low-carbon, climate-resilient investment has also improved:

- Political, macro-economic, and financing risks are the main obstacles that limit private investment in renewable energy projects in developing countries (Frisari et al, 2013; UNFCCC, 2014).

- Private investment in climate resilience is hindered by lack of information and lack of awareness of climate risks, lack of technical capacity to carry out the necessary investments and measures, and lack of access to affordable, long-term finance to address such risks (Stenek et al., 2013).

- Limited access to finance represents a major constraint for household and industrial investment in energy efficiency with credit risk also an important issue (NCE, 2014).

The value of many risk mitigation instruments is not systematically tracked either by international financial statistics on development finance (for instance, by the statistical framework of the OECD's Development Assistance Committee) or commercial data providers (Caruso and Jachnik, 2014). Estimates of their overall value, or of the value of climate finance mobilised by effective risk mitigation measures since 2010 have not been identified.

Risk mitigation instruments for low-carbon energy projects

Multilateral Development Banks (MDBs), Export Credit Agencies (ECAs), and bilateral finance institutions such as the Overseas Private Investment Corporation (OPIC) use different instruments to lower investment risks and attract private investment in low-carbon energy, most notably guarantees and insurances.[46] Loan guarantees, generally provided by MDBs, cover lenders against the risk of their debt not being repaid should the borrower default. Export

46 The difference between guarantees and political risk insurance is small. Guarantees typically provide a straightforward and timely payment in the event of a borrower defaulting on a debt. In contrast, insurance typically requires a period in which the claim is evaluated meaning the time needed till reimbursement can vary significantly from case to case (Matsukawa, 2007; Frisari et al. 2013).

credit guarantees protect international traders against losses arising from non-payment of their exported goods and services (Matsukawa and Habeck, 2007).

Guarantees

MDB guarantees can leverage significant private flows through guarantees but their usage remains relatively low and the use of guarantees for climate-related operations is even lower. Collectively, MDBs committed approximately USD 15 billion to guarantees between 2010 and 2013 for operations in all sectors. In 2013, commitments for guarantees made up to only 4.5 % of MDBs' total financing (Humphrey and Prizzon, 2014). Between 2010 and 2012, the World Bank Group (WBG) organizations[47] jointly committed USD 570 million in risk mitigation instruments on average per year to climate change projects in developing countries (Micale et al., 2013). Despite being a widely used instrument in the past, especially for large-scale energy projects, WBG guarantees have only occasionally been used for risk mitigation in climate-related investment (Micale et al., 2013). WBG guarantees are estimated to have mobilised close to five dollars of private investment for each dollar of guarantee financing (WBG, 2015). International Finance Corporation (IFC) guarantees appear to have been more suitable for smaller-scale use, being employed by commercial banks and microfinance institutions to raise funds to support their lending activities for microfinance purposes. In July 2014, a new WBG operational policy framework on guarantees came into effect, aimed at facilitating increased use of guarantees across the WBG's activities to help it mobilise private sector financing for IBRD and IDA member clients (WBG, 2014a).

Other examples of MDBs using climate-relevant guarantees include the Inter-American Development Bank (IDB) which issued a climate-related guarantee valued at USD 200 million to a hydropower plant in Costa Rica in 2012 (Lindenberg, 2014). Similarly, the ADB's India Solar Guarantee Facility is a USD 150 million partial risk guarantee program for solar projects with government-backed power purchase agreements, although only two solar projects had been covered as of June 2012 (Vyoma Jha, 2014).

Political risk insurance

Political risk insurance typically covers investors against losses arising from currency inconvertibility, political violence, governmental interference, expropriation and policy changes causing a breach in an existing contract (e.g. a power-purchase agreement) (Matsukawa, 2007). The Multilateral Investment Guarantee Agency (MIGA) and OPIC are the most notable dedicated public sector providers of political risk insurance to private investors for cross-border investments in developing countries (Frisari et al., 2013). MIGA is the largest provider of risk mitigation instruments within the WBG and it is increasingly involved in climate change operations. Political risk insurance offered by MIGA for climate projects from 1990 to 2012 totalled approximately USD 1 billion (Micale et al., 2013). In the financial years 2013 and 2014, MIGA committed USD 1.63 billion of insurance to cover 12 projects contributing to GHG emission reductions (WBG 2014b; 2015a).

OPIC, which provides US businesses with different financial services to enable their investment in developing countries, is stepping up its commitment to renewable energy projects substantially, from USD 131 million in 2009 to USD 1.55 billion in 2012. Loan guarantees made

47 International Bank for Reconstruction and Development (IBRD); International Development Association (IDA); Multilateral Investment Guarantee Agency (MIGA); International Finance Corporation (IFC).

up 63 % USD of the 1.55 billion, and insurance covering US investors against losses arising from political risks just 3 % (Christianson et al., 2013; Micale et al. 2013).

Export Credit Agencies

Although they don't have a specific development or climate mandate, Export Credit Agencies (ECAs) are well placed to mitigate risks faced by domestic companies and their lenders in the international trade of renewable energy components (Buchner et al., 2011). There is evidence that official export credit guarantees can play a critical role in enabling private investment and facilitating financial closure of climate-relevant projects in developing countries (EKF, 2014; Boyd et al., 2013). The "export credits" used by ECAs include insurance, guarantees and financing solutions. In particular, export credit guarantees and insurance cover exporters or lenders financing exports for losses arising from political and commercial risks (e.g. non-payment under contractual agreements) (Matsukawa, 2007).

Pioneering ECAs are demonstrating the potential of these instruments:

- In 2014, the Danish Export Credit Agency (EKF) provided a "project finance guarantee" to Vestas, the leading Danish producer of wind turbines, to support the development of the largest wind farm in Africa. The EUR 120 million EKF guarantee unlocked debt financing from the European Investment Bank (EIB) and the African Development Bank (AfDB), which enabled the largest ever private investment in Kenya (EKF, 2014).

- In 2009, the Ex-Im Bank of the United States became the first ECA to adopt a carbon policy, introducing enhanced support for low-carbon projects and establishing a USD 250 million renewable energy facility.

- In 2012, Ex-Im Bank authorised USD 614.5 million in financing to support over USD 1.18 billion of US exports of climate-related goods and services (although accounting for 1.7 % of its total authorizations that year).

- Ex-Im Bank provided at least USD 702 million in financial support to climate-relevant sectors between 2008 and 2012, for projects mostly located in Latin America and Asia. Export credit insurance was utilised in 56 % of all deals, while direct loans accounted for 85 % of all the financial support to these projects (Christianson et al., 2013).

ECAs are increasing collaboration with each other, the OECD and relevant authorities in order to expand their capacity to mobilise private climate investment (EKF, 2014). For instance, in June 2014, ECAs agreed to provide longer-term loans for climate mitigation and adaptation to better suit the longer life cycle of renewable energy and other climate-friendly projects, thus contributing to making such projects more competitive and attractive to investors (OECD, 2014b).

Foreign currency risk instruments

In addition to insurance, guarantees and export credits, increasing the availability of instruments to manage foreign exchange risk could unlock cross border investments in many developing countries that could count toward the USD 100 billion commitment. Foreign exchange (FX) risks arise when a project's revenues and its loan repayments are in different currencies. This is the case in many emerging markets where infrastructure finance, including renewable energy finance, is provided in USD or other developed country currencies. Local capital markets are not sufficiently deep to offer project finance in local currencies, nor can they offer suitable hedges for currency risk (Donnelly, 2015).

Donor-backed institutions such as the International Finance Corporation (IFC) and the Currency Exchange Fund (TCX) are working to address this investment barrier by increasing renewable energy project developers' access to local currency finance and hedging tools. IFC has been providing cross-currency swaps[48] and local currency loans since 2000. TCX has provided currency swaps worth over USD 1.5 billion in 48 currencies since 2009 (TCX, 2015). Both institutions are working together to increase the availability of FX risk management tools and provide longer term hedges through an instrument that is currently being explored by the Global Innovation Lab for Climate Finance.[49] A pilot of this instrument could support more than USD 1.5 billion in clean investment projects and reduce GHG emissions by 1.7 Mt CO_2 per year by 2020 (Escalante at al., 2015 forthcoming).

Risk Mitigation for Energy Efficiency

Credit risk and limited access to finance are two of the main constraints for energy efficiency investment in developing countries (Frisari et al., 2013). Large- and small-scale industrial, commercial and residential actors have difficulty accessing low-cost finance and local banks often have difficulties in assessing the risk of loans to these projects. Several instruments exist to drive private investment into energy efficiency.

Targeted lines of credit from bilateral and multilateral DFIs are a bridging solution. Since 2006, the EBRD has provided more than EUR 2 billion in credit lines and technical assistance to support development of energy efficiency financing among local banks in Eastern Europe and Central Asia through its Sustainable Energy Financing Facilities (SEFFs) (EBRD, 2015). Elsewhere, the Global Climate Partnership Fund (GCPF) has delivered dedicated financing and technical assistance to financial institutions in developing countries, to unlock investment in energy efficiency and renewable energy from private households and SMEs.[50]

MDB risk-sharing programs aimed at local commercial financial institutions are another solution to stimulate energy efficiency lending at more attractive terms:

- Under the China Utility-Based Energy Efficiency Finance Program (CHUEE), the IFC advised Chinese companies and local banks on low-carbon projects, and provided a loss reserve to participating banks in order to encourage them to build their capacity for financing sustainable energy projects by extending loans to smaller enterprises. As of the end of 2013, local banks had lent over USD 790 million to more than 220 energy efficiency and small-scale renewable energy projects (IFC, 2015).

- In March 2015, the World Bank and the Government of India signed a USD 43 million agreement for the Partial Risk Sharing Facility for Energy Efficiency (PRSF) that will help Indian enterprises and Energy Service Companies (ESCOs) address financing barriers and mobilise commercial finance for investments in energy efficiency initiatives (WBG, 2015b).

Energy Performance Contracts (EPCs) have also been effective at unlocking energy efficiency investments in developed countries. Replicating this approach in developing countries, where markets for the Energy Service Companies (ESCO) that carry out the energy efficiency measures are immature, will require instruments such as

48 Cross-currency swaps can protect investors against exchange rate risk by allowing two parties to agree to exchange a flow of payments in different currencies, at a pre-determined rate, regardless of market exchange fluctuations over the agreement period.

49 See www.climatefiancelab.org for more information.

50 See http://gcpf.lu/ for more information.

insurance, or performance guarantees that cover the risk that the projected energy savings outlined by ESCOs in their EPCs are not met (e.g. IDB in Colombia and Mexico) (Micale and Deason, 2014). In Brazil, energy performance insurance is provided by IDB to ESCOs along with a credit guarantee (EEGM, 2015). IFC is proposing a similar program in South Africa. In China, EPCs are also backed by credit lines, such as in the ESCO Loan Guarantee Program (WEC, 2013).

Instruments to scale-up adaptation and disaster risk management

Awareness is growing of the role that the private sector can play in contributing to reduce countries climate vulnerability. Bilateral and multilateral DFIs, governments and climate funds can use a wide range of instruments and actions both to stimulate private investment in increasing the climate-resilience of businesses, and to create public-private partnerships to deliver more conventional disaster risk mitigation programs for developing countries. For example, since 2012, the Pilot Program for Climate Resilience (PPCR), operating within the Climate Investment Funds, has committed more than USD 75 million in concessional resources to support innovative programs and projects that engage private actors in reducing developing countries' climate vulnerability (Trabacchi et.al, 2013). An IFC-PPCR project in Nepal has developed the capacity of agribusiness firms and local commercial institutions to transfer skills and resources to farmers, thus demonstrating a business case for private sector adaptation in the agricultural sector (Trabacchi and Stadelmann, 2013).

In March 2015, world leaders at a UN Conference on Disaster Risk Reduction in Japan finalised a new framework to help governments address natural disasters caused by extreme weather events. It included for the first time, guidelines to stimulate climate resilience in the private sector based on a stronger public-partnerships to raise disaster awareness and reduce risks and was endorsed by the global insurance industry (UNEP, 2015).

Key messages

- Since 2010, governments and domestic, bilateral and multilateral public institutions have improved risk mitigation coverage for climate projects. Between 2010 and 2012, the World Bank Group committed USD 570 million in risk mitigation instruments on average per year to climate change projects in developing countries.

- Export Credit Agencies could play a growing role providing loan guarantees for lenders to international renewable energy projects.

- There is potential to expand the mandates of public actors to provide better risk coverage.

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IMPRINT

Published by
Federal Ministry for the Environment,
Nature Conservation, Building and Nuclear Safety
(BMUB), Division KI II 7

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn

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Design
Schumacher. Visuelle Kommunikation, Darmstadt
www.schumacher-visuell.de

Printed by
druckriegel GmbH, Frankfurt

Printed on 100 % recycled paper, certified to
FSC standards

Eschborn, June 2015