
ACCOUNTING OF PRIVATE CLIMATE FINANCE

TYPES OF FINANCE, DATA GAPS AND THE 100 BILLION DOLLAR QUESTION

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Executive Summary

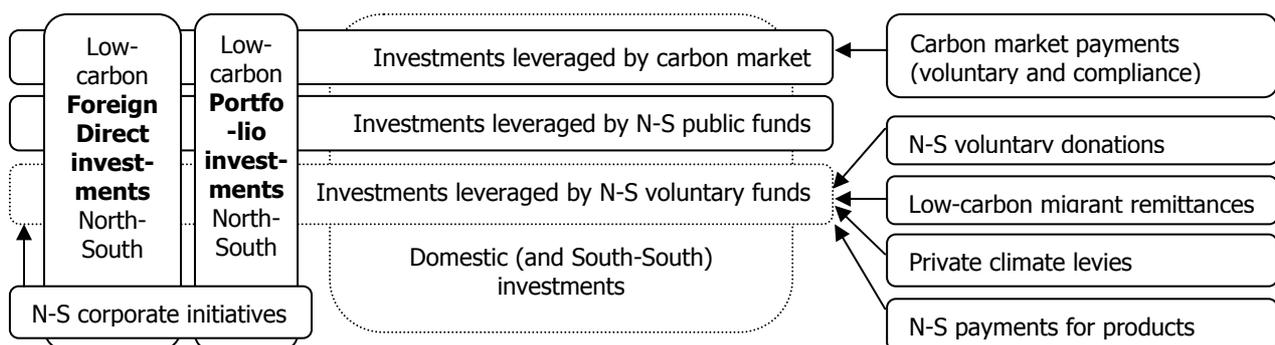
So far, studies have closely examined data on *public* climate finance while leaving data on *private* climate-related funding flows largely unexplored. This is surprising, as there is wide acceptance for a key role of private finance in achieving low-carbon development and resilience to climate change, given that the private sector is responsible for the majority of investments in developing countries. Furthermore, accounting of “private funds” has received a political dimension in the context of the goal of industrialized countries to provide US 100 billion dollars of public and private finance to developing countries by 2020, on an annual basis. In this context, tracking of private financial flows for climate finance is a precondition for transparency, improved access to finance and learning from successful programmes.

We analyze the main research gaps as identified by the literature: definition of different private climate funding types, the availability of data, the system for tracking flows, and criteria for including funds in the US 100 billion dollar figure.

Private climate flows: more than just FDI and payments for carbon credits

While most scholars and policy makers only analyze Foreign Direct Investment (FDI) and payments for carbon credits, we have identified a whole range of private funds related to climate change. Among investments, FDI is complemented by other investment flows such as portfolio investments, referring to cross-border investments not taking substantial controls of foreign companies. Furthermore, rather than focusing on North-South investments, we can also examine investments in Southern projects that have been mobilized by industrialized countries through bilateral and multilateral funding or carbon market payments. Then, carbon market payments can be split into different categories: payments for abatement costs, transaction costs, and rents as well as payments above market price. Last but not least, voluntary climate funds are often neglected: beside voluntary offsets and private climate finance levies we may also think about climate-friendly migrant remittances, private donations, corporate initiatives and payments for low-carbon products. We also briefly discuss the role of private foundations, NGOs and religious organizations in buying offsets or enhancing the adoption of lower-carbon technologies in developing countries. Especially payments for low-carbon products are important, as industrialized countries have increased their import of emissions-intensive products to an extent that their total consumption-related emissions have increased. One of the problems is that some of these funds are overlapping; e.g. funding leveraged by carbon market payments are also accounted as foreign direct investments (see Figure).

Figure: Overview of private climate-relevant flows for low-carbon development



N-S = North-South

Data on CDM available, while investment figures and data on voluntary funds missing

We estimate that annually up to \$70-180 billion of private climate finance is flowing North-South or is taken place in developing countries as a consequence of Northern actions. The broad range of these estimates indicates the wide uncertainty and low quality of data in many of the categories just mentioned. Quality of data is best for carbon market payments (<\$2 billion p.a.) and investments leveraged by carbon market payments (\$15-30 billion per year). While the number of carbon credits is exactly known, the credit price is only approximately known and the investment figures would be enhanced by knowing the exact year of

investment. Less data is available for low-carbon FDI (roughly \$30-40 billion p.a., as estimated by UNCTAD) and investments leveraged by industrialized countries' public funds (\$20-90 billion p.a. - the large range is due to uncertainty on climate-relevance of public funds and public-private leverage ratios). Even less is known on voluntary funds, where only voluntary offsets and private levies for climate finance are confidently estimated at \$0.25 billion per year. For other voluntary flows, no data on climate-friendliness is known but billions are potentially paid; e.g. North-South migrant remittances amount to \$150-200 billion and private donations reach \$50 billion per year.

Advantages of a decentralized tracking system with strong guidance by the UN

This is a complex area to attempt to fathom, but international promises require some kind of system for tracking the level of different types of financial flows. Buchner et al. (2011) provide two straw-man proposals for tracking climate finance, one with all information flowing through national communications to the UNFCCC, and a one involving international institutions directly reporting to the UNFCCC. Our analysis of different institutions concludes that a system relying on data of international organizations rather than national reporting has several potential advantages: experience in collecting data, established tracking systems, speed of release through real-time updating, and consistency of categorization which ensures comparability of data. Annual or biennial national communications may have a complementary role, providing additional data where needed and on a voluntary basis. The UNFCCC will certainly have central functions such as analyzing (or even verifying) reported data, setting up definitions and procedures for tracking and analysing private flows, and finally providing guidance to data collecting institutions, which may include private actors. Some of the functions (especially the more technical ones) may be delegated to the new Standing Committee on Climate Finance, whose role is still to be defined. Any tracking system will have to deal with the challenges of overlaps in data collection, confidentiality barriers and assuring that the COP has the authority to define climate finance. We imagine that a system where tracking and verification rules are set by the UNFCCC, where experienced and independent institutions collect data and where reporting is regular but organized efficiently) may deal with these challenges.

Inclusion in \$100 billion: the solution is neither zero nor six criteria

Including all private climate flows in claims of meeting the international goal to provide \$100 billion by 2020 will not be meaningful, as private flows relevant from a North-South perspective may already exceed \$100 billion today, and some private funds may not be steered by climate policy. Therefore, some private funds may have to be excluded from being counted in meeting that pledge, using criteria that can be politically agreed as valid. As three initial criteria for what should count towards meeting the Cancun Agreements, we propose those which can show *additionality* (mobilized by public actions), *predictability* (some stability over time), and basic *equity* (no negative redistribution and funds to the most vulnerable). Furthermore, three other criteria should be applied. First, that there be "*no double counting* with emission reduction targets," as this would further decrease the already low ambition of international pledges. Second, funds should "*address barriers*"- as finance flowing after investment barriers have been removed do not make any difference. Finally, it must be required that there be reliable and complete *data available to verify* the level of funding.

Applying all criteria is not sensible, as only two funding types fulfil all six criteria: carbon market payments that go beyond the standard market prices, and private levies for private finance, which together amount to less than \$0.15 billion per year currently. As this is certainly not the level of private funds envisioned in the Copenhagen Accord, policy makers may have to exclude some criteria. If "double counting" is excluded then carbon market payments are part of the \$100 billion, but the level of private flows will not exceed \$2 billion at present. If we exclude "addressing barriers", then leveraged private funds and some low-carbon FDI are included, raising the private finance number potentially above \$100 billion, already today. This shows that the selection of criteria is absolutely crucial for the relevance of climate funding targets.

A meaningful political decision would aim for a private finance figure that requires an increase of public climate funds to reach the \$100 billion by 2020, but this increase must be achievable. Neither including all private flows nor including very few, as given in the case of applying all six criteria, fulfils this requirement for a meaningful political decision. The largest challenge is to define the amount of leveraged investments to be included; too lenient a definition may make the \$100 billion figure meaningless.

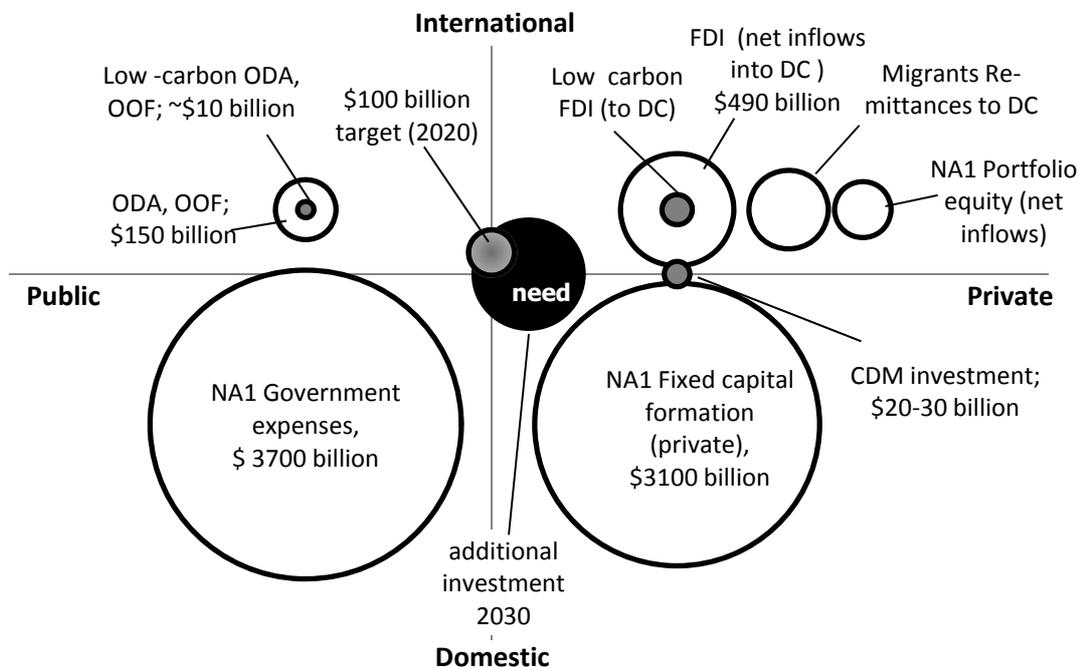
Introduction

Tracking and accounting private climate finance is urgently needed for two main reasons. First, with the aim of reaching an ambitious post-2012 climate agreement, wealthy nations in Copenhagen and Cancun in 2009 and 2010 set a goal of reaching "\$100 billion of public and private funds", annually by 2020, in order to assist developing countries in low-carbon and climate-resilient development. As private investment is expected to be a large portion of meeting that promise, tracking is required. More fundamentally, to solve the problem of rapidly growing emissions of greenhouse gases in developing countries, there is a need to shift and leverage private investments towards lower-carbon technologies. Tracking such private investments, may help to assess effectiveness of international climate policy.

Importance of private finance for climate change mitigation

The sheer ambition of limiting global warming to 2°C, which is seen as needed to keep Earth from experiencing "dangerous climate change", will require huge amounts of investments, which cannot be met by public finance only. Rather, substantial private investments have to be leveraged for clean energy and sustainable agriculture, forestry and waste management. Recent estimates to achieve the 2° target require additional energy investment flows to non-OECD countries of around \$200 billion per year in 2020 and \$180-570 billion per year by 2030 (UNFCCC, 2008a; IEA, 2009; World Bank, 2009). This is a very ambitious goal when compared to existing international financing flows (see Figure 1). Low-carbon foreign direct investment (FDI) flowing into developing countries have reached \$30-40 billion in 2008-2009 (UNCTAD 2010), while (both domestic and international) annual investments through the CDM as North-South carbon market mechanism were around \$15-30 billion for CDM projects registered in 2009/2010 (URC, 2011). The \$500 billion of additional investments dwarfs international public flows, while it roughly equals *total* current FDI flowing into developing countries.

Figure 1: Comparing 2030 low-carbon investment needs in developing countries (black) with current and promised climate funding (grey) and general (white) flows (per year)



Sources: UNCTAD (2010) for low-carbon FDI, UNCTAD (2011) for FDI and migrants remittances, World Bank (2011b) for government expenses, fixed capital formation and portfolio equity, OECD (2011d) for ODA/OOF, URC (2011) for CDM investment in 2009-2010. DC = developing countries; here defined as countries not in the annex 1 of the UN Framework Convention on Climate Change

Looking for private finance for climate change mitigation and adaptation is warranted not only because the volume of finance needed is far beyond anything mobilized by governments in the past, but also because the private sector is involved in so many key sectors and its participation would provide many co-benefits. However, mobilizing and accounting of these private finance also raises several key challenges, such as confidentiality, additionality, distribution and negative side effects (see Box 1).

Box 1: Importance and challenges of tracking private climate finance

Importance

- *Size*: Private sector investments have overtaken Official Development Assistance (ODA) as the main source of North-South transfer of flows in the early 1990s, and may form important “new and additional” resources for sustainable development (Gentry and Esty, 1997). Nowadays, private North-South flows are estimated to be at least three times larger than public North-South flows (see Figure 1)
- *Private sector involvement in key sectors*: Sectors important for climate change mitigation (especially construction, energy, forestry and industry) are dominated by the private sector in many developing countries. For investing in the low-carbon infrastructure needed for a 2°C global pathway, private finance have to be shifted and leveraged massively (LSE, 2009; Ward, 2010; Brown and Jacobs, 2011)
- *Co-benefits*: It has been argued that private low-carbon investments have co-benefits such as health improvements, energy access, job creation, preservation of biodiversity, and creation of business sector know-how in climate change mitigation and adaptation (Bystricky et al., 2010). Some evidence indicates that growth related to FDI may even reduce air pollution (Wheeler, 2001), especially via the use of international pollution standards, which may be more strict than national standards.

Accounting challenges

- *Confidentiality*: companies may not be willing to share all information, as this may reduce their advantages over their competitors (Buchner et al., 2011).
- *Additionality and Leverage*: Private investments are not necessarily additional to the “business-as-usual” case, as billions of dollars are already being invested in low-carbon technologies (Atteridge, 2009). Similar to this question is the one of “leverage”. Are private finance really leveraged/mobilized by climate policy interventions or would they flow anyway?
- *Double counting*: If carbon market funds are counted towards the \$100 billion target, then their efforts are counted twice: offsetting towards the emission targets and contribution towards the finance target (Roberts et al., 2010b; Schroeder, 2010).
- *Division of public and private*: In the literature, public funds and private investments are clearly separated. However, in reality, the division is not as clear cut, as shown by the cases of public-private partnerships, CDM payments (paid by the private but induced by public policy goals) and the importance of public investments (e.g. the electricity sector in China and India heavily relies on public investments, see IEA, 2009).

The \$100 billion figure – what is meant by “private finance”?

The discussion on the importance private finance was taken up by the Copenhagen Accord, where industrialized countries committed to the goal of \$100 billion of public and private finance for developing countries¹, annually by 2020. The level of ambition of this pledge will depend on the kind of finance included. Most discussions in the last few years have circled around the question how public climate finance such as grants and loans is reported and accounted for (Michaelowa and Michaelowa, 2010; Roberts et al., 2010b; Tirpak et al., 2010). This focus on public finance is mainly due to the fact that fast-start funding (2010-2012 climate finance) only includes public finance, and developing countries (as opposed to industrialized countries) are mainly interested in the tracking of public climate finance and accountability (UNFCCC, 2011c)².

¹ “In the context of meaningful mitigation actions and transparency on implementation, developed countries commit to a goal of mobilizing jointly \$ 100 billion dollars a year by 2020 to address the needs of developing countries. This funding will come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance (UNFCCC, 2009).” Almost the same wording has been integrated in the Cancun Agreements (UNFCCC, 2010), where the wording “scaled-up, new and additional, predictable and adequate funding” has been moved closer to the 100 billion dollars figure.

² Several industrialized countries (Australia, the EU, New Zealand, USA) mention private funds in recent submissions on tracking of climate finance, while developing countries only mention public funds (UNFCCC, 2011c).

Information on tracking *private* finance is scarce; only few studies have made some preliminary remarks on monitoring, reporting and verification (Roberts et al., 2010b; Tirpak et al., 2010; Buchner et al., 2011) and some reports have sketchily estimated the existing flows (UNFCCC, 2008a; Buchner et al., 2011; van Melle et al., 2011). The current state of research is that information on private climate finance is sketchy (but exact data availability is unknown) and an agreed definition of “private climate finance” is missing (Buchner et al., 2011).

Regarding the question which type of private finance to count towards the \$100 billion target, there are even fewer studies. It is only clear that counting all private finance does not make sense (because we may already be beyond the \$100 billion per year), while not counting any private finance will go against the wording of both Copenhagen and Cancun.³ The most extensive effort of assessing the inclusion of private funds in the \$100 billion figure has been made by the UN High Level Advisory Group on Climate Finance (UN, 2010c), that has outlined some ideas of how to count private funds (e.g. gross vs. net carbon market and investment flows) but did not make any final conclusion on which types of private funds to count.

Aim of paper

This paper aims to fill this research gap on how to (ac)count private climate finance (both in general and towards the \$100 billion target) by;

- reviewing all different types of private climate finance
- analysing the availability of data
- outlining options for improving data and tracking private climate finance
- assessing different funding types according to possible criteria for inclusion in the \$100 billion total and finally, giving recommendations on how to move forward in tracking and accounting private finance.

Addressing this research gap serves several purposes. It will increase transparency and accountability of financial flows, it may improve access to public and private funding, and it may enhance learning on sources and levels of funding needed. Finally, it may help to develop a definition on what the key phrase \$100 billion of “public and private climate funds” really includes. As te Velde (2010) put it, “What is the point of a number without a definition?”

³ A former Japanese government official says that “Non-annex 1 countries are rejecting any private sector flows to be counted in the \$100 billion” (McGarrity, 2011) but this stance is obviously going against both the Copenhagen Accord and the Cancun Agreements.

Types and dimensions of private climate finance (and rough scale)

When the \$100 billion of public and private climate finance was agreed, parties appear to have had very different ideas on the kinds of private flows that should be included. As there are no clear agreed statements on the type of private flows in the negotiated texts, we will analyze the whole spectrum of private flows: private investments, payments for carbon credits and voluntary payments.

Private investments

Investments are certainly the most discussed private flows, especially related to the way they are leveraged by public finance (see e.g. LSE, 2009; Ward, 2010; Brown and Jacobs, 2011; te Velde, 2011). The Copenhagen and Cancun wording leaves open whether private finance includes only North-South private flows or all private finance mobilized by Northern countries. Therefore, we will in the following analyze North-South investments (direct and other types of investments) as well as investments leveraged by industrialized countries' policies or funds (bilateral, multilateral agencies, and carbon markets). Clearly, if both types of finance are to be added up, procedures to avoid double counting are required.

Foreign Direct Investment (FDI)

FDI is relevant for climate change, as it is the largest North-South flow since 1992 (Gentry and Esty, 1997), it flows to a significant extent into mitigation-relevant sectors (Corfee-Morlot et al., 2009), and environmental policies of foreign direct investors may have a significant influence on the carbon-intensity of investments.

FDI is an investment where the investor receives "control or a significant degree of influence on the management of an enterprise that is resident in another economy" (IMF, 2009). The OECD (2008) sees this control or influence as given if a foreign investor acquires at least 10 per cent of the foreign company, while the IMF definition is more flexible. Special arrangements have been made to account for the emerging complex investment structures of multinational companies (e.g. holdings).

FDI data is available from the OECD and UNCTAD. While the UNCTAD covers FDI in- and outflows of all countries, OECD has further data on partner countries of FDI but only receives data from OECD countries (OECD, 2011b; UNCTAD, 2011)⁴. Therefore, the OECD data is more suited to track North-South flows (rather than just "to-South" flows) but data from the recipient end is missing.

While general FDI data is available, the larger challenge is to track the share of FDI supporting climate change mitigation and adaptation. Official data only gives limited indications by dividing FDI into economic sectors. By using such sectoral data, Corfee-Morlot et al. (2009) have estimated that in 2003-2005 around \$250 billion of FDI flowing to developing countries has been "relevant" for climate change mitigation. "As "climate-relevant" just refers to an influence on climate change mitigation, we have to differentiate it from "climate-specific" flows that really address climate change mitigation and adaptation (Corfee-Morlot et al. 2009). The figure for "mitigation-specific" FDI will be closer to the numbers generated by UNCTAD (2010), who used investment-level data from the private website "FDIintelligence.com" to identify around \$30-40 billion of FDI in three low-carbon sectors (renewable energy, recycling, environmental technology manufacturing) flowing to developing countries in the years 2008/2009. One could argue that this figure is probably giving a lower end of low-carbon FDI, as several low-carbon investments (especially energy efficiency and waste management) are not included. On the other hand, FDI in sectors like recycling may well be mechanizing work that was done by very low-carbon and labour intensive actors such as waste-pickers. Also environmental technology need not reduce greenhouse gas emissions (for example, SO₂ scrubbers reduce the efficiency of coal power plants and thereby increase CO₂ emissions. The \$30-40 bn figure covering low-carbon sectors is, certainly much closer to climate-friendly FDI than FDI in "mitigation relevant sectors", which is suggested to be the upper bound of climate FDI by (Buchner et al., 2011). In all those figures, FDI with adaptation benefits is missing. Further data improvements may be achieved by including private databases on clean energy investment projects (e.g. New Energy Finance or Dealogic, see Tirpak et al., 2010), but it is clear this is an area needing further study.

⁴ FDI is both tracked as stock and flow; for comparability with other types of climate finance the flow value may be more adequate.

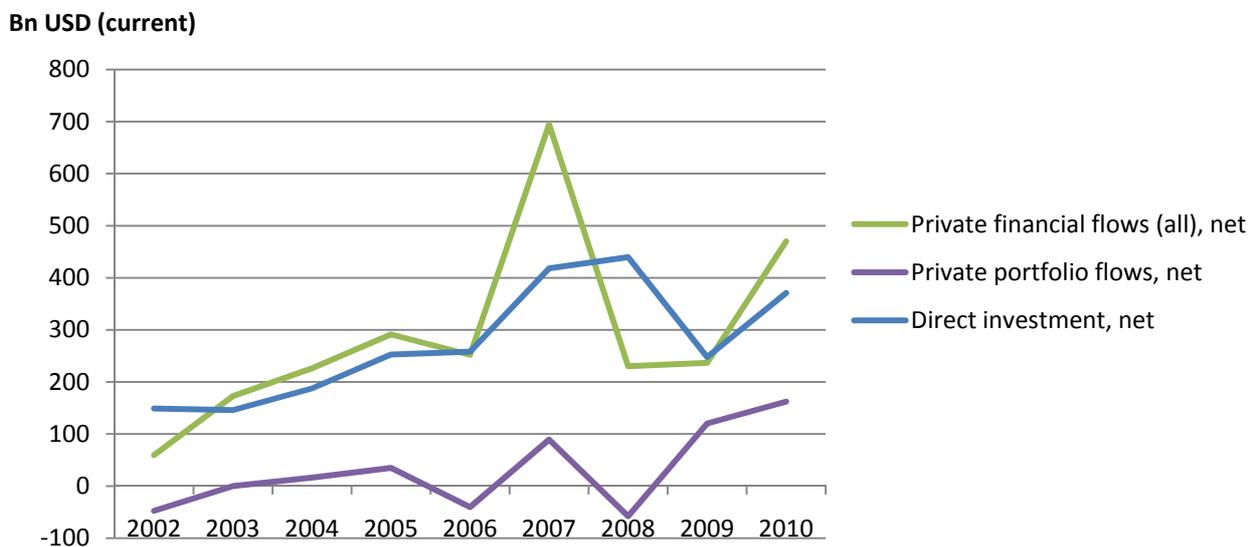
Portfolio and other types of investment

Portfolio investments have not been discussed by existing studies (Corfee-Morlot et al., 2009; Tirpak et al., 2010; Buchner et al., 2011), but they may be climate-change-relevant as they are substantial; they constitute roughly \$80 billion per year, or around 15% of FDI flows to developing countries (average 2005-2009 data from UNCTAD, 2011; World Bank, 2011b). Portfolio investments include investments from sovereign wealth funds and institutional investors, which are potentially important sources of (public and) private climate finance (te Velde, 2010), as investors seek to lower the carbon impacts of their investments.

Portfolio investments are defined (as compared to FDI) as investments where the foreign investor does not acquire control or significant influence on the management of the foreign company. Portfolio investment constitutes "cross-border transaction and positions involving debt or equity securities" (IMF, 2009), where the equity share does not reach 10% of the foreign company⁵. Securities are easily tradable assets, which means that portfolio investments can fluctuate substantially in short periods⁶ (see Figure 2). Therefore including portfolio investments in climate finance may run counter the idea of "predictability" of climate finance. Nevertheless, portfolio investments may have a significant influence on the carbon-intensity of a nation's development path; if stock values of low-carbon businesses rise, then they may find it easier to raise capital and build that sector.

Data on portfolio investments are available from World Bank (2011b) and IMF (2011), while no sectoral data is available. Therefore, estimating low-carbon securities investments would require the challenging task to either analyze the average stock trading of low-carbon businesses located in developing countries or to analyze portfolios of large investment companies and pension funds. Assuming that the share of low-carbon portfolio investments is similar to the rough share of low-carbon FDI according to UNCTAD (5%⁷), then annual low-carbon portfolio investment can be estimated to be at least \$3-4 billion a year.

Figure 2: Volatility of private investment flows flowing into developing and emerging economies



Source: IMF (2011)

⁵ And the securities are not used as reserve assets of monetary institutions.

⁶ Average portfolio equity (net inflow) to developing countries crashed from more than \$100 billion a year to minus values in 2008 before returning to values over \$100b in 2009 and 2010 (Fig. 2; IMF 2011).

⁷ The share of low-carbon FDI (only renewable energy, recycling and environmental technology) has been around 5% over the 2003-2009 period, while reaching values of more than 7% in 2008 and 2009 (values from UNCTAD, 2010; UNCTAD, 2011). As we discussed above, such a sectoral classification may not be accurate as both high-carbon investments may be included and low-carbon ones excluded.

Further functional categories of investment include financial derivatives, employee stock options and other investment (IMF, 2009); the low-carbon value of these types of investments is even more difficult to assess than for direct and portfolio investments.

Low-carbon investments could also be classified by instruments (equity, debt) rather than by functional categories (direct, portfolio). However, information on low-carbon equity and debt is difficult to acquire. The Bank for International Settlements (BIS) provides together with the World Bank and IMF data on external debt (loans, debt securities) (JEDH, 2011). However, data is not clearly split by sectors, so assessment of climate-beneficial funds is difficult.

Investment leveraged by industrialized countries

Apart from North-South investment flows we can also estimate private investments leveraged by industrialized countries actions (either through payments or policies). Clearly, such funds may overlap with FDI and portfolio investments (see below, how we deal with this overlap). Such leveraged investments may not only include international but also domestic capital. The key challenge here is that there is no agreed methodology on how to calculate the amount of leveraged funds (Hosier et al., 2010; Brown and Jacobs, 2011; Stadelmann et al., 2011). For calculation of the leverage, the type of finance to be included matter as well as additionality, or whether finance would have been flowing anyway (without intervention by Northern governments). We distinguish here between investment leveraged by multilateral agencies, bilateral agencies and the carbon market.

Investments leveraged by bilateral agencies

Bilateral agencies that report to the OECD currently spend around \$6-9 billion on climate change mitigation per year (OECD, 2011d)⁸. Of all bilateral agencies, bilateral development banks (BDB) probably leverage most private finance as they are targeting businesses. Four BDBs (JICA, KfW, AFD, EIB) have indicated that they committed around \$10-13 billion of climate finance annually in 2009 (Kehler Siebert et al., 2010). These discrepancy in figures - four institutions report to spend more than all agencies together - is another indication of the low data quality of public climate finance identified by others (Michaelowa and Michaelowa, 2010).

While bilateral agencies do not report on leveraged private finance, we can estimate \$10-40 billion leveraged, assuming \$5-10 billion of bilateral climate finance and using the rather conservative leverage factor of 2-4 used by the UN High-level Advisory Group on Climate Change Financing (UN, 2010b).

Investments leveraged by multilateral agencies

Multilateral agencies report to the OECD that they currently spend around \$4-6 billion on climate change mitigation per year (OECD, 2011d)⁹. These numbers do not include adaptation funds, GEF funds as well as funding from the development banks ADB, IDB and AfDB, who all do not report the climate relevance of their funding. All multilateral development banks report investments in climate change mitigation (including energy efficiency, renewable energy, forestry and transport) of around \$17 billion in 2009, and projected investments of \$20 billion by 2012 (UN, 2010a). Again, data quality is low, so multilateral climate finance could be in the range of \$5-20 billion, including both grants and loans.

Like bilateral agencies, most multilateral institutions do not report on leveraged investments. The only reports come from the World Bank's Climate Investment Funds, who report a leverage factor of more than 8 and the Global Environment Facility (GEF), who estimates that co-funding of climate projects reaches 6 to 7 times of the GEF grants level. As both institutions also include public as leveraged finance, the real amount of private finance leveraged is probably also in the range of 2-4 times the grant/loan amount (Stadelmann et al., 2011)¹⁰. Therefore, we can estimate leveraged investments in the range of \$10-80 billion.

Investments leveraged by the carbon market

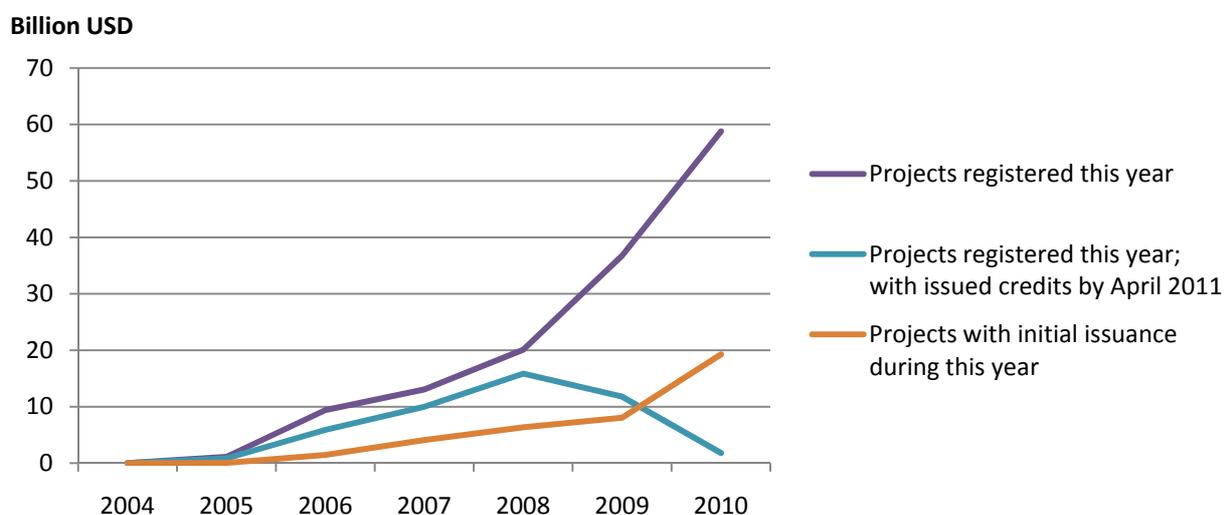
⁸ In 2009, bilateral agencies reported to have spent \$4.9 billion (\$7.4 billion committed) on projects related to climate change; \$0.5 (1.2) billion related to biodiversity and climate change, and \$0.6 (0.5) billion related to biodiversity, desertification and climate change (all values in 2009 \$, including Official Development Assistance only). (OECD, 2011a)

⁹ In 2009, multilateral agencies reported to have spent \$3.4 billion (\$4.1 billion committed) on projects related to climate change and \$0.7 (1.5) billion related to biodiversity, desertification and climate change (all values in 2009 \$, including Official Development Assistance and Other Official Flows). (OECD, 2011a)

¹⁰ For a sample of 68 CC projects, a leverage ratio of 3.5 (private to public funds) has been calculated (Stadelmann et al., 2011)

Finally, the carbon market is seen as a major tool to incentivize low-carbon investment in developing countries. The Clean Development Mechanism (CDM) as North-South market mechanism has annually registered projects with an investment volume of \$10-60 billion in 2006-2010, whereas actual investment may have only reached \$20 billion in the years 2008-2009 due to delay in project implementation (see Figure 3). Assuming a one year delay between registration and implementation and 80% of registered projects being implemented, annually around \$15-30 billion have been invested in CDM projects in the years 2009-2010. This figure may decrease significantly in the next few years, if industrialized countries do not set more ambitious targets and allow for carbon offsets in the period beyond the Kyoto Protocol's likely 2012 sunset. However, new market mechanisms (e.g. the Japanese bilateral crediting scheme) may make up part of the CDM losses. In case of the CDM, the question of "additionality" of projects has been extensively discussed (Michaelowa and Purohit, 2007; Wara and Victor, 2008; Schneider, 2009). While we may assume, following the literature, that part of CDM investment is not additional, this may also apply to investments "leveraged" by public agencies.

Figure 3: CDM investments



Source: URC (2011)

Gross vs. net flows

Investments flows may be accounted as gross values (see all values above) but at least three ways of calculating net investments flows exist. The first way is the standard net FDI inflow calculation applied by UNCTAD: decreases in liabilities (of domestic companies towards foreign investors) are subtracted from increase in liabilities. Therefore, the net FDI inflow may be negative in certain years when disinvestment happens. This distinction seems to be applicable to the case of climate finance, and it is already included in FDI and portfolio investment calculation. The second way of calculating net investments is to subtract FDI outflows from inflows. This is, however, not beneficial for the climate change case, as low-carbon investments of Southern companies in the North have positive climate benefits, so subtracting would form a perverse incentive not to invest in low-carbon businesses in the North. The 3rd way is to assess net benefits, as proposed as an option by the UN High-level Advisory Group (UN, 2010c): the net benefit of investment would be calculated as the net revenue achieved for developing countries by lowering the return requirement of Northern capital through public interventions¹¹. Another way of calculating the net benefit is to assess the % of energy efficiency improvement, as done by the ADB¹² (see Annex of Tirpak et al., 2010).

¹¹ The report (UN, 2010b) gives the following example: if the return requirement of capital is reduced by 2% (through lowering risks by guarantees or other instruments), then the net benefit of investment for developing countries is roughly 10%, assuming a benchmark return rate of 10-15% IRR and 10 year lifetime of an investment.

¹² If a system with 62% energy efficiency is replaced by a 70% energy efficient system, then only 13% ($70\% - 6\% \cdot 2 / 62\%$) of the ADB investment is seen as net climate investment flow.

While data for net FDI inflows according to the UNCTAD definition and inflow minus outflows are available, the net benefit calculation would require a complicated assessment for each investment, with high uncertainty.

A related point is the distinction between “greenfield” investments and “merger and acquisitions”, which are normally not distinguished in FDI data (Bazilian et al., 2011) but have different implications for climate change; while greenfield investments will help to set up new low-carbon infrastructure, simple mergers may hardly have any impact on greenhouse gas emissions at all.

North-South vs. all flows

The wording in the international agreements on the \$100 billion figure does not clearly exclude domestic and South-South flows if leveraged by interventions of industrialized countries, as the exact wording in the Cancun and Copenhagen agreements is “developed countries commit to a goal of mobilizing jointly USD 100 billion dollars a year by 2020”. Still, the intent of the Copenhagen and Cancun promises was from the global North to the South. The High-level Advisory Group (UN, 2010c) seems to exclude domestic (and South-South) investments but from a climate policy perspective, it is rather irrelevant where the capital is coming from as long as investments are shifted towards low-carbon and climate-resilient investments. The share of developing countries in FDI outflow has risen from 5% in 1990 to 20% in 2009 (using data from UNCTAD, 2011). Including or excluding Southern capital may therefore be relevant, as there is an increased role of South-South transfers and domestic investment. For instance, 29 of the \$ 136 billion of low-carbon FDI flowing into developing countries in the period 2003-2009 has been coming from other developing countries (UNCTAD, 2010).

Furthermore, a significant share of CDM investments is domestic or South-South, such as Chinese firms financing renewable or emissions control devices in neighbouring or further-flung host nations, or locally. As an indication of Southern investment, we may take the share of CDM projects without an official Northern project participant. Through March 2011, 18% of CDM investments were registered projects without any Northern project participant, while a full 74% of investments in projects under validation (these are earlier stage CDM projects) had no project participant from an industrialized country (URC, 2011). The real share of domestic investments may be even higher: e.g. Lütken (2010) estimates that 90% of Chinese CDM projects are owned by the Chinese government.

Proxy data is available to distinguish North-South from domestic and South-South investments in the case of the CDM and FDI. In the case of bilateral and multilateral agencies, new data would have to be collected.

Total vs. incremental investment

Another potential distinction is between total and incremental investments. Incremental investment is the additional capital that low-carbon and climate-resilient technologies require in comparison to alternative investments. The non-incremental part of total investments can be seen as being “shifted away” from more carbon-intensive and less-resilient alternatives to climate-friendly technologies (e.g. building a modern 1000 MW coal power plant may require \$1.5 billion of investment, while building wind power plants with equivalent power production (so a capacity of around 3000 MW) needs double this investment volume; in this case only 1.5 of the \$3 billion invested in wind power to replace coal would be seen as “incremental” investments).

Data for incremental investments is partly available in the case of the CDM, where project proponents have to set out alternative investments in case different technological options are available. In all other cases, only total but not incremental investment figures are available. Obliging agencies and companies benefiting from public climate finance to calculate incremental investments will be onerous, but it will help improve our understanding of whether alternative investments in the absence of climate finance are likely and, therefore, emissions are reduced, or if climate finance merely leads to no further CO₂ emissions (while not reducing CO₂).

Public vs. private investments

As evidenced by the case of Chinese CDM projects, part of the investments will be from public sources. Should those investments be excluded here? Rather than a pure yes or no answer, a more adequate

agreement may be that no distinction between public and private investments has to be made, as long as two conditions are met: public investments have to take place at commercial terms and it has to be assured that funds are not double counted.

Payments for carbon credits

The second major type of private finance potentially to be included in the \$100 billion is North-South payments through the carbon market. In this chapter we do not deal with investments from carbon market programmes, which are included under investments, nor do we discuss voluntary carbon market payments, which are discussed under voluntary funds below. Among carbon market payments, we may include payments through the Clean Development Mechanism (CDM) as current project-based market mechanism under the Kyoto Protocol but also future North-South carbon market tools such as bilateral trading schemes (see the Japanese bilateral offset scheme), new market mechanisms under the UNFCCC or even payments for allowances from national emission trading systems in the South (e.g. from the planned Chinese regional trading systems).

Payments for carbon credits in general¹³

At first sight, payments seem to be easily calculable by multiplying the credits with their market value. Using this method, the 123-137 million CDM credits issued annually in the years 2008-2010 (URC, 2011) equal around \$2.4-2.6 billion (assuming an average of \$20 per issued credit). However, in most cases the credits are not sold when they are issued (as so-called secondary credits) but long before they are issued (as primary credits). The price per credit in such primary transactions is in most cases much lower than the actual market price for secondary credits, as investors need a guaranteed credit price and buyers are only willing to buy credits in advance, if they can counterbalance the risks with a lower price.

While the secondary CDM market price is public (via information platforms such as Point Carbon or credit exchange platforms such as ICE/ECX), most primary prices are only known to buyers and sellers. Point Carbon, the World Bank and the GIZ try to gather as much information as possible, and publish annual (Point Carbon, World Bank) or monthly (GIZ) estimates for primary market transactions. The World Bank (2011a) has estimated primary transactions of annually \$2-7 billion in 2007-2010, while actual payments are lower as credits are issued later or not at all.

A good proxy to estimate actual annual flow of payments for carbon credits is to multiply issued credits of unilateral CDM¹⁴ projects with current secondary market prices and other issued credits with an average primary price estimate. Using this method, the average price per credit in 2008-2010 has been around \$13.3 per CDM credit (Stadelmann et al., 2011), and payments for the annually 123-137 million credits issued equal around \$1.6-1.8 billion per year. This calculation is just a proxy, as the price sources are on an aggregate level. Real numbers may both be lower, as low-price market transactions are kept secret and also higher as some actors pay more than market prices (see below).

Splitting carbon market payments

All payments for credits can be split into different parts: payments for abatement costs, transaction costs, infra-marginal rents, and payments above market prices.

Payments for abatement costs

One part of the CDM credit payment is needed to pay for the cost of abating greenhouse gases; or in other words the money needed to reach the required level of return for an GHG abatement project. Abatement costs can be well below \$1 per tonne of CO₂ (e.g. HFC projects), which means that only a small share of the credit payment is needed, while other projects (e.g. solar PV) have abatement costs well above the CDM market price, meaning that the CDM alone is not enough to enable the investment. Some projects may even

¹³ One could argue that payments for abatement and transaction costs are made to pay back part of the investments, and, therefore, counting these funds along leveraged investments means double counting. Therefore, we subtracted abatement and transaction costs from the overall private finance figure (see comments below Table 1).

¹⁴ Unilateral projects are defined as CDM projects with no project participant from industrialized countries at the time of registration. As the project participant is normally the buyer of credits, unilateral projects are more probable to sell credits only after issuance, so at secondary market prices.

have negative abatement costs (e.g. some energy efficiency projects): only transaction costs (see below) are preventing them from happening.

Abatement costs have been calculated for around 250 CDM projects by Castro (2010). Using her median values for abatement costs per project type, we arrive at average abatement costs of credits issued through the end of March 2011 (URC, 2011) of \$1.4 per tCO₂, so roughly 10% of the estimated average credit payment, or \$0.2 billion per year. However, these costs are increasing as the share of industrial gas projects fall; we would expect values of \$5-6 in the not too distant future.

Payments for transaction costs

Financial transactions such as carbon market payments imply costs beyond the actual payments, which include identification of transaction options, preparation of contracts and verification. Such transaction costs include in the case of the CDM the following; searching for transaction partners, negotiation of contracts, project development, regulatory approval as well as monitoring & review (Michaelowa and Jotzo, 2005). The CDM transaction costs have been projected before the start of the CDM by Michaelowa and Jotzo (2005) to be in the range of 0.3-1 EUR per CDM credit for projects with annually 20-200 thousand credits, which is roughly the range for average CDM projects. While transaction costs may have increased due to higher verification costs and uncertainty of approval, a range of \$0.5-1.5 per average CDM credit seems to be realistic for transaction costs¹⁵, which would equal around \$0.1-0.2 billion per year.

Payments for infra-marginal rents

When subtracting the abatement and transaction costs from the average credit payments, the remaining value is rents that can be captured by various market participants: the project owner, investors, consultants, brokers or governments¹⁶. Such rents are part of any competitive market, where only the marginal supplier of carbon credits will have no rents as his abatement and transaction costs equal the market price. Some members of the UN High-level Advisory Group on Climate Change Financing proposes that only such "infra-marginal rents" in carbon markets should be counted as net flows to the \$100 billion target (UN, 2010c). Assuming average abatement costs of \$1.40/credit, transaction costs of \$0.5-1.5/credit and average payments of 13.3 \$/credit, current payments for infra-marginal rents are roughly 10.5-11.5 \$/tCO₂ or \$1.2-1.5 billion per year (over the period 2008-2010).

Payments above market price

As a final portion of carbon market payments, some buyers pay more than the market price for CDM credits. The main reasons for higher payments are connected to actual or perceived co-benefits of certain project types. In the context of the CDM, such co-benefits have been studied through the lens of whether the CDM contributes to sustainable development as set out as its goal in the Kyoto Protocol (Sutter and Parreno, 2007; Nussbaumer, 2009). Co-benefits may include job creation, environmental preservation or the promotion of technologies that are expensive at the moment but are projected to become more relevant and less costly in the future (e.g. renewable energies). Several labels have been created to tag "high value" CDM credits; the best known are the "Climate, Community and Biodiversity" standard for forestry projects and the "Gold Standard" for energy projects with verified sustainable development benefits. Gold Standard CDM credits were getting a premium of 2 € before the financial crisis of 2008 and a premium of 8 € in March 2010 (Camerata and Kartick, 2010). Chinese wind projects got a premium of over 2 € before the financial crisis struck in 2008 (Wu and Sheng, 2008). CCBA-backed forestry CERs have not yet been issued so no premium can be calculated.

While data is not available for payments above market price, we can estimate its value by assuming price premiums of \$5/tCO₂ for Gold Standard and \$2/tCO₂ for wind projects. When multiplying those premiums with respective credits issued until March 2011 (URC, 2011), the total added Gold Standard credit value to date is \$23 million and added wind power value \$66 million.

Public vs. private payments

¹⁵ The UN High-Level Panel (UN, 2010c) assumes \$3 of transaction cost per carbon credit but does not cite any sources. It seems to be a conservative estimate in order to not overestimate infra-marginal rents.

¹⁶ As many carbon market actors are international, it is not assured that those rents are actually captured by Southern companies or organizations.

While the literature normally discusses the CDM under “private finance”, carbon market payments are by no means only private; many credits are bought by public entities. From an accounting perspective, it is not needed to distinguish public from private carbon market payments, as long as carbon market payments are not accounted as official public funds¹⁷, as both serve the same purpose (offsetting Annex-1 emissions).

Voluntary payments

While not often discussed in the climate regime, voluntary funds by companies, NGOs and private persons may form an important part of private sector finance for climate change actions in developing countries. We distinguish here between migrant remittances, private donations, voluntary offsets, corporate initiatives, payments for low-carbon services and private levies.

Migrant remittances

Migrant remittances, consisting of compensations for short-term migrant workers, monetary transfers of longer-term migrants and wealth transfer through migration (OECD, 2006), has shown an exponential increase, and reached almost \$300 billion in 2010 for all developing countries combined (UNCTAD, 2011). In 2009, \$174 billion of such remittances to developing countries originated from OECD countries (Hudson Institute, 2011). In some countries, migrant remittances contribute more than 20% to their GDP (OECD, 2006). Migrant remittances have proven to promote self-employment, investment in small businesses, home improvements, and to some extent upgrading family education (Rapoport and Docquier, 2006), which may all be indirectly beneficial for activities for driving low-carbon development and climate-resilience. However, some remittances will drive substantially higher-carbon lifestyles in non-migrant parts of families. While this indirect impact of migrant remittances on climate change may be difficult to capture, a direct impact may exist through climate-friendly remittances. For instant, several examples of South-North migrants are known to invest in low-carbon technologies and climate resilience in their home countries (Asia, Africa); some try to further promote these technologies through the CDM and the voluntary carbon market¹⁸.

No data on migrant remittances promoting climate resilience and low-carbon development are known, but we estimate these numbers could be a very small proportion of total migrant remittances, probably well below five percent.

Private donations

Private donations are an important part of North-South flows. Several examples of NGO activities in developing countries with climate-benefits can be found, e.g. conservation activities, promotion of energy efficiency, disaster risk reduction and other programmes for climate change adaptation.

Official OECD (2011c) data reports \$22-23 Billion of grants by private agencies in 2008/2009. However, data from several countries (France, Norway and Spain) is missing entirely and some other countries’ data is incomplete. The conservative Hudson Institute (2011) estimates that private grants are far higher, reaching \$53 Billion in 2008/2009. No detailed data on climate-related activities among this total is available. The Bill and Melinda Gates Foundation has recently become the only private agency reporting project-level data to the OECD (2011d) for its funded projects, including short project descriptions, which could be climate-coded, similar to past analysis of ODA (Michaelowa and Michaelowa, 2010; Roberts et al., 2010a). Unfortunately, the Gates Foundation is not reporting on Rio markers and represents less than 3% of North-South private grants.

Voluntary offsets

Voluntary carbon offsets represent voluntary payments of companies, NGOs, governments and private persons to offset their carbon emissions by financing projects reducing CO₂ emissions. The over-the-counter voluntary carbon market has risen from close to zero in 2005 to annually \$0.4 billion in 2008, while levelling off since then (Hamilton et al., 2010; World Bank, 2011a). In 2009, around 33% of emissions were offset by projects in developing countries (Hamilton, 2010). As the European offset market with higher prices is

¹⁷ The accounting of CDM payments as ODA is to our knowledge not happening. However, some CDM projects receive co-financing through ODA and CDM capacity building is seen as ODA.

¹⁸ At least 5 examples of such migrants investing in climate-friendly activities are personally known to the authors.

mainly relying on projects in developing countries, the share of financial flows to developing countries is roughly 40% or around \$0.15 billion per year.

Data on voluntary offsets is published annually by the World Bank and Ecosystem Marketplace. Part of voluntary offsets may also be counted as “private grants” or “corporate initiatives”, so double counting may be a problem.

Corporate initiatives

Companies do not only invest in climate-friendly activities in developing countries but they also support projects with climate benefits, as part of their corporate social responsibility (CSR) policies. Examples include carbon offsets, support of climate policy in developing countries (e.g. the Climate Group with its activities in China), selling environmentally-friendly products in developing countries at a reduced price, or spending additional funds to secure a sustainable supply chain (e.g. sustainable wood or palm oil). It is an open question if high-carbon activities of multinational companies have to be somehow subtracted from such climate-friendly funding.

Coherent data on corporate climate initiatives is missing, while some flows are included under voluntary offsets and private grants. The International Chamber of Commerce and the UN have worked together to provide better information on flows of corporate beneficence (like drug companies selling HIV drugs at or below cost in Africa, some UN connection on that publicity)

Payments for low-carbon services and products

Public and private actors in industrialized countries have a large leverage on carbon emissions in developing countries as they import many goods and services, which have been produced by emitting greenhouse gases (e.g. in factories, oil drilling or transport). Some countries like Norway and Switzerland even emit more emissions abroad than at home (Hertwich and Peters, 2009). Emissions embodied in goods imported by industrialized countries (and originating in developing countries) have grown by more than 1.2 G tCO₂ from 1990 to 2008 (Peters et al., 2011), which is double the emission reduction agreed under the Kyoto Protocol. So even when industrialized countries meet their Kyoto targets they will have been increasing their emissions abroad by more than double this amount in the same period.

Estimating the amount of climate-friendly product purchases is difficult. Data on traded products is available from various sources (e.g. UNCTAD, 2011; WTO, 2011). The most detailed data, however, is available from the UN Comtrade website (UN, 2011), where imported and exported commodities are listed. While commodities emitting no or low carbon in their use (bicycles, railways, solar plants and wind turbines) can be found, commodities produced in a climate-friendly way cannot be identified. Either new categories have to be created or other sources (such as value of purchased wood certified with the Forestry Stewardship Council label) have to be identified.

Private levies for climate finance

Last but not least, the private sector may in some cases take over the governmental role of raising funds for climate finance. This happened in the case of Switzerland where business organizations, in order to prevent a higher CO₂ tax, set up the private foundation “Climate Cent”, which was funded by a CO₂ levy on diesel and gasoline. The revenues (around \$0.1 Billion annually) are used for international and domestic offsets (Climate Cent, 2011).

Available and needed data on private flows

Table 1 provides an overview of private flows with climate benefits that are relevant from a North-South perspective. All known flows amount to estimated \$60-160 billion after deducting double-counted flows (see below), while this figure also includes South-South transfers and some domestic investments in developing countries. Carbon market payments are currently amounting to less than \$2 billion a year, but this number may substantially increase in the future, if emission targets become stricter and new market mechanisms are introduced. Regarding other private finance flows little is known. For all these flows, higher data quality and comparability is needed, which is generally an issue when including all developing countries in a dataset (Bazilian et al., 2011). While data is best for the carbon market, more details have to be collected on low-carbon FDI, leveraging ratios of public funds and the climate relevance of voluntary private funds.

Table 1: Overview of private climate flows flowing to developing countries or invested in developing countries as a consequence of activities by industrialized countries

Type of flow	Subtype	Estimate d climate-friendly flow per year	Year	Data quality & sources
Investments	Low-carbon FDI	\$30-40 Billion	2008-2009	0 (UNCTAD, 2010)
	Other low-carbon investments	~\$3-4 (?) of 80 Billion		-(UNCTAD, 2010)
	Leveraged by bilateral agencies	\$10-30 Billion*	2009	0 (UN, 2010c; OECD, 2011a)
	Leveraged by multilateral	\$10-80 Billion*	2009	0 (UN, 2010c; OECD, 2011a)
	Leveraged by carbon market	\$15-30 Billion*	2009-2010	+ (URC, 2011)
Carbon market	Total payments for credits	\$1.6-1.8 Billion		+ (URC, 2011)
	Payments for abatement costs	\$0.2 Billion	2008-2010	0 (URC, 2011)
	Payments for transaction costs	0.1-0.3 Billion \$	2008-2010	0 (URC, 2011)
	Payments for inframarginal rents	1.2-1.6 Billion \$ \$	2008-2010	0 (URC, 2011)
	Payments above market price	<0.05 Billion \$	2008-2010	0 (URC, 2011)
Voluntary funds	Migrant remittances	Share of 174 Billion \$	2009	-/0 (UNCTAD, 2011)
	Private donations	Share of 53 Billion \$	2008-2009	-/0 (Hudson Institute, 2011)
	Voluntary offsets	0.15 Billion \$	2008-2009	+ (Hamilton et al., 2010)
	Corporate initiatives	Unknown		-
	Payments for products	Potentially billions		0 (UN, 2011)
	Private levies for climate finance	(0.1 billion \$, included under CDM)		0 (Climate Cent, 2011)
Total private finance		~ 60-160 Billion \$**	2008-2010	various

+ means sufficient data quality, 0 insufficient and – very sketchy data quality

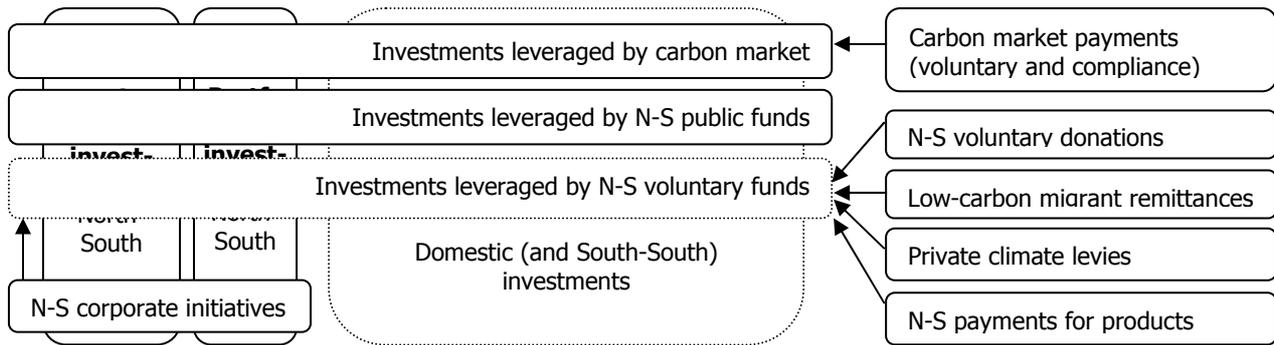
* Includes South-South and domestic investments, both public and private

** Adding up all numbers would result in 71-188 Billion \$. However, this number is an overestimation as some finance is double counted. First, the payments for credits are already included in the investments leveraged by the carbon market (see footnote 13) . Therefore, we deduct abatement and transaction costs (0.3-0.5 Billion \$). Second, some of the leveraged investment overlaps with low-carbon FDI and portfolio investments. In order to control for these double-counted flows, we deducted 20% of all “leveraged” investments, conservatively assuming that 20% of leveraged investments are North-South flows (while the share of FDI net inflows and portfolio investments as proportion of gross fixed capital formation in developing countries has only been 13% in the years 2005-2009 on average (using data from World Bank, 2011b), we can assume that projects with international involvement have higher share of foreign investments)

Double counting problems and domestic investments

When aggregating flows, we face the problem that some flows may overlap, particularly “leveraged investments” and North-South FDI and portfolio investments (see Figure 4). While we have accounted for this by using a rough deduction for “double counting” in Table 1 (see comment below the table), exact numbers will be difficult to assess. Furthermore, one has to be aware that a large part of “leveraged funds” will be domestic investments in developing countries (and to a smaller extend South-South transfers); FDI has only accounted for 13% of gross fixed capital formation in developing countries the years 2005-2009 (calculated using data from World Bank, 2011b).

Figure 4: Overview of private climate-relevant flows for low-carbon development



N-S = North-South; all flows surrounded by a solid line are included in Table 1.

Before collecting more data, common definitions of private climate finance are needed as well as a good tracking system, to which we will turn next.

Institutions for data collection, reporting and verification

Our analysis of private climate flows, which has looked at more types than previous studies, confirms the previous findings (Corfee-Morlot et al., 2009; Tirpak et al., 2010; Buchner et al., 2011) that much less data and advanced data collection systems are available for private compared to public funding. As Tirpak et al. (2010) have argued, we need private finance data to receive a complete picture of climate finance flows. To achieve this full picture, better data collection systems have to be institutionalized. We will, therefore look at institutions that could potentially fulfil different tasks in tracking of climate finance, such as collection of data, reporting, verifying, or synthesizing it; or in the more classic climate policy terms – “MRV: monitoring, reporting and verification”.

Potential institutions for tracking climate finance

- *International organisations* are particularly useful for data collection, as some of them (e.g. OECD, UNCTAD) have already established systems for tracking private financial flows. Rather than building new data collection and verification systems, the existing procedures could be improved and linked up to make a collaborative whole. For example, collecting low-carbon FDI data could be done by UNCTAD, private finance leveraged through public finance by the OECD, or refined CDM investment flow data by the UNEP RISOE centre. These international organizations could directly report their data to the UNFCCC under agreed standards, which would make it possible for data to be comparable across countries. For all organizations, especially the ones representing only industrialized countries such as the OECD, some guidance by the UNFCCC secretariat or the COP may be needed.
- *Parties to the UNFCCC* may report private financial flows through their national communications (and the biennial updates). Actually, parties should report on private sector finance in current communications, but only half of the Parties currently do so (Tirpak et al., 2010). As private sector flows may be counted towards the \$100 billion by 2020, there may be an additional incentive for industrialized countries to collect and report this data. However, it is an open question for negotiation of whether reporting private flows should become obligatory, as it may be onerous and may duplicate the work of international organizations. The issue is that data included in national communications will probably not achieve the same comparability level as data from international organizations, who normally verify data to a certain extent. Therefore, parties may mere be invited to provide information that is complementary or additional to data already requested by international organizations. Much additional information can be extremely useful; for example a repository system for data from climate finance recipients is needed, as some international organizations (e.g. the OECD) receive information almost exclusively from Northern contributor agencies.
- *The UNFCCC in itself* may have an important role in synthesizing the information provided and defining private climate finance flows if needed. While some high-level questions (e.g. what to include in the \$100 billion figure) may have to be decided at the level of the COP, the detailed definition and tracking methods of private climate finance flows may be elaborated by the SBSTA (with potential delegation to the new Standing Committee). The synthesizing of information may be conducted by the UNFCCC secretariat¹⁹, which transfers the information to the COP via the SBI. Some part of the analysis and the elaboration of methodologies for analysis could again be delegated to the Standing Committee²⁰.
- *Non-governmental actors*, finally, may take over some tasks in tracking private flows. Parties, the UNFCCC or international organization may delegate or subcontract tasks for data collection, verification and synthesizing to NGOs, universities or specialized companies. Some non-governmental initiatives (e.g. FDIintelligence.com; AidData, 2011; HBS/ODI, 2011; WRI, 2011) already have vast experience in tracking public flows, which could be extended to private flows. Other actors do already track private finance (e.g. Financial Times, New Energy Finance, and Point Carbon) and may be charged with provision of data. Furthermore, private actors may also be a source of additional, complementary information, following the idea of crowd-sourcing (see AidData, 2011).

Open questions: National communications, data collection methodologies and analysis

One of the key institutional questions is the role of national communications. This issue has been brought up by Buchner et al. (2011) in two straw-man proposals on tracking climate finance, where they mainly

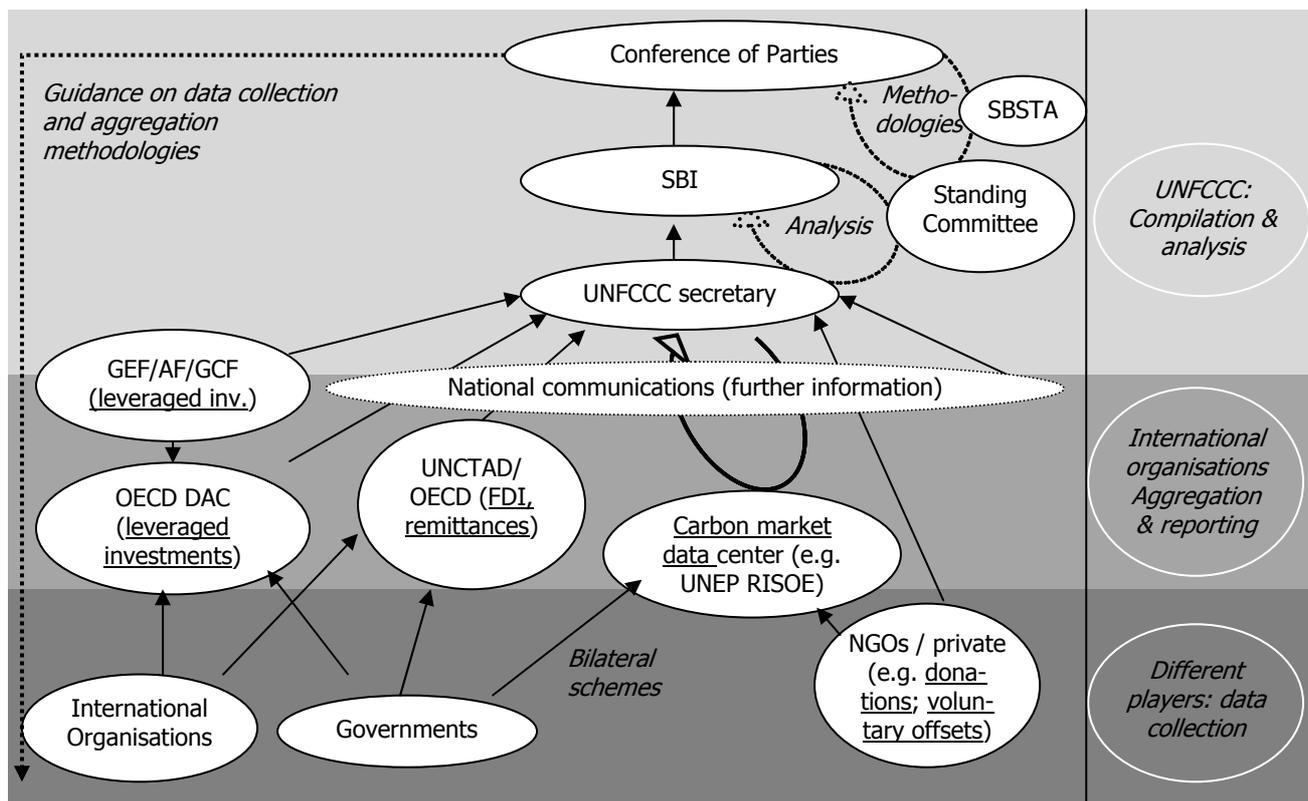
¹⁹ See UNFCCC (2011a) for an existing attempt of the secretariat to synthesize public finance information.

²⁰ At this moment in time, it is difficult to suggest exact roles for the Standing Committee as the views on its functions are very divergent: while some propose that it should enhance sharing of information (Umbrella), others see an extended role such as ensuring a periodic overview of all flows (EU) or even taking part in the MRV of support (G77) (UNFCCC, 2011b).

dealt with public finance. In one of their proposals, all finance information would flow through the UNFCCC National Communications (and the new biennial reports as defined in the Cancun Agreements). The advantage of this system is country ownership and awareness of the financial flows paid and received. However, countries' capacity to collect data of a sufficient quality may be limited. The advantage of the 2nd straw-man proposal, where international organizations would directly report to the UNFCCC using a diversity of reporting systems, is the reliance on existing systems and greatly enhanced comparability. In such a system based on international organizations, national communications may still have a role in either reporting part of the private flows (e.g. information on leveraged flows as suggested by Buchner et al. (2011)), or by providing supplementary information.

Figure 5 shows a schematic for tracking climate finance under the UNFCCC, including private finance only. National Communications are surrounded by a dashed circle, as it is an open question whether they serve as the main tool, through which all information on private climate finance are reported, or if national communications (and biennial update reports) are simply providing complementary information. Some main differences from the straw-man proposals of Buchner et al. (2011) are the inclusion of further private flows (e.g. donations, voluntary offsets, migrant remittances), potential roles of private actors, which has already been suggested as an option by Tirpak et al. (2010), the use of UNEP RISOE as main data collection centre for CDM data²¹ and delegation of information on leveraged finance to the OECD²².

Figure 5: Potential reporting and analysis of private climate finance & elaboration of methodologies



Dashed lines show development of methodologies for data collection and analysis, as well as the guidance provided to Parties and international institutions, while solid lines show flow of private finance information

²¹ The advantage of the UNEP RISOE center is the existing link to the UNFCCC, the experience with CDM data and its relative independence (the World Bank is involved itself in financing of projects). Potential alternative candidates include Point Carbon but UN institutions may be more trusted than private institutions.

²² The advantage of using the OECD is their existing project-level data on official aid flows (ODA/OOF) and the Rio markers labeling climate-related projects. Leveraging of private funds has to be connected to data on public climate finance. Unless a new system of reporting project-level public climate finance is established (under the mandate of the UNFCCC), the OECD seems to be the right place for collecting leveraged private finance.

Figure 3 also shows potential procedures for elaboration of data collection methodologies and analysis of provided information. While some data collection methodologies have already been set up (e.g. in case of the CDM or FDI in general) and can just be adopted by the COP, in other fields, such as donations or low-carbon FDI, the COP has to elaborate methodologies (e.g. through the SBSTA and the Standing Committee), before it can adopt them and provide guidance to international organizations and parties. We also would propose the consideration of international standards for reporting data that would allow its rapid compilation and analysis, such as the one being developed under the new IATI (International Aid Transparency Initiative) for public development flows. Furthermore, the procedures for analysis (and, if needed, verification) of data have to be defined. Most information will already undergo an internal review process of international organizations (e.g. in case of FDI), while other information will not have been reviewed before reaching the UNFCCC. Therefore, the UNFCCC does not only have to compile information but also to analyze it. In Figure 3 we propose that the SBI delegate data compilation and analysis to the UNFCCC secretariat, with a potential role for the Standing Committee as an expert panel to provide methodologies for reporting and analysis.

Challenges in data collection systems for providing climate finance

In any system of collecting private finance, at least four challenges arise: overlaps in data collection, confidentiality, authority of the COP and speed.

First, some of the collected data will overlap. If data on leveraged private investment and low-carbon FDI is collected, then portions of the reported flows are actually the same (see Figure 5 above). As solutions, either some of the flows are not seen as private climate finance under the \$100 billion (see assessment below) and are, therefore, not reported, or clear rules are defined to avoid double counting. This avoidance of double counting would probably require project-level data.

Second, private finance flows are sometimes not available because of concerns about confidentiality (e.g. CDM credit prices, individual investments), see Buchner et al. (2011). To circumvent confidentiality problems, data has to be reported at an aggregate level. Another way to assure that data can be collected is to delegate data collection to independent, trusted institutions, which can guarantee data security and confidentiality. This may be another reason to rely largely upon international organizations, as some governments and other agencies may not be able to achieve the same access to data as others.

Third, using a decentralized system with several international and even private institutions reporting raises a challenge concerning the level of authority of the Conference of the Parties (COP), and indirectly the authority of the treaty's Parties. What does "authority" actually mean in the case of reporting data on private flows of climate finance? The difference between "guidance" and "authority" has been discussed in relation to the operational entities of the Financial Mechanism. Müller (2009) concluded that the implicit difference between being "under the authority of the COP" (as in case of the Adaptation Fund Board) or "under guidance of the COP" (as in case of the Global Environment Facility) is that in the former case the COP can approve general rules and guidelines and can select the members of the institutions' board. In case of collecting private finance data, it is clear that the data collection organizations *themselves* will not be under the authority of the COP, which would include the selection of their board's members. However, the definition of rules and guidelines on how to define and track private climate finance would be under the authority of the COP. Just providing "guidance" to the data collection organizations is a necessary but not a sufficient condition for authority. On top of guidance, the COP may also have authority related to analysis and verification of reported data.

Fourth, can private finance data be provided in a timely fashion? In the case of data provided by international organizations about levels of FDI and investment in the CDM, data is being made available annually, and if resources for data collection are made available, the improved data (e.g. low-carbon FDI) may also be available on an annual basis. Some data is available one year later, some data only arrives to the public 1.5 to 2 years later (e.g. ODA data). This speed of data provision is certainly faster than in case of information provided by national communications mandated under the UNFCCC.

While the new biennial reports may make national reporting of private finance as up-to-date as that of international organizations, the comparability of data among nations may be lower. With good definitions

and data reporting standards, data can be far more accessible and analysis provided nearly instantaneously. However developing these systems takes some upfront investment in computing systems, staff capacity building, and in agreeing standards of reporting, definitions, and categories of reporting.

In the end, there remains the question of whether private climate finance has to be reported as soon as possible (e.g. more than every two years), since private climate finance may not be as politically sensitive as public climate finance.

Possible assessment criteria for inclusion in meeting the \$100 billion pledge

Criteria for including private finance in the \$100 billion figure may be found in some of the key international climate policy texts. To start with, “mobilization by governments” may be a criterion as the Copenhagen Accord and the Cancun Agreements (UNFCCC, 2009, 2010) state that “industrialized countries “commit to the goal of *mobilizing* jointly USD 100 billion”. Furthermore, the wording of “scaled-up, new and additional, predictable and adequate funding” may imply further criteria. While “adequacy” is somehow captured by the “\$100 billion” figure, we may use additionality and predictability as two further criteria for assessment. Furthermore, in the same paragraphs of the Cancun agreements, it is mentioned that “the urgent and immediate needs of developing countries that are particularly vulnerable to the adverse effects of climate change” should be taken into account. This may be captured with a broader “basic equity” criterion, which does not only include funding for vulnerable countries but also the question if there is any net incidence (net costs) for developing countries, a criteria introduced by the UN High-level Advisory Group (UN, 2010c).

Apart from “additionality”, “predictability” and “basic equity” as suggested by the Cancun agreements, we will add three other criteria. First, “no double counting”, as using part of the \$100 billion for meeting emission targets by industrialized countries, will lower the overall ambition of international pledges. A second criterion is whether financial flows are “addressing barriers”, or if funding only flows if barriers have been removed by other means. Third, the availability of quality data has to be a criterion for whether to include a type of flow in meeting the \$100b/y promise, as this may restrict the ability of any system to retain credibility while including that type of climate finance.

We will now define the different criteria further and assess different types of private flows against those criteria. An overview of the assessment is given in Table 4.

“Mobilizing Jointly” Additional Finance

The Cancun Agreements recognize that developed countries “commit to the goal of *mobilizing* jointly USD 100 billion”. Therefore, private finance has to be mobilized by industrialized countries who have committed to the \$100 billion target. While one may argue that non-governmental entities in industrialized countries may also mobilize funding, negotiators and politicians can in the end only commit to funding what they can influence, so private actions not influenced by governments cannot be seriously considered as “mobilized”. Certainly, there is a grey zone with private funding where government actions may have an influence, however the causal link would be quite unclear (for example, information campaigns might seek to mobilize voluntary N-S low-carbon investment).

To which extent are the different types of private finance “mobilized by industrialized countries’ governments”? To start with, voluntary funds are by their definition conducted by choice and not caused by any government coercion or incentive. Therefore, voluntary funds are not to be seen as “mobilized”, unless a clear link to public policy (e.g. tax incentives, information campaign) can be made²³. Similarly to voluntary actions, many low-carbon FDI and other investments will also happen without any public intervention, as low-carbon investments may be profitable anyway. In contrast, investments leveraged by bilateral and multilateral agencies as well as through the carbon market can be considered as “mobilized,” because they only emerge as a result of public climate interventions. Potentially, some investments have to be deducted, as some leveraging would have happened without international climate policy (see baseline discussion above). Finally, payments through the carbon market are most clearly “mobilized”, as the carbon market has only emerged as consequence of (international) climate policy²⁴.

Additionality

Some private finance may have also been mobilized by industrialized countries’ in absence of international climate agreements. Therefore, we have a similar question as for public funding: what is the “business-as-usual”, non-climate-policy baseline of public funding, above which funding can be considered as “new and additional”? In case of public finance, at least eight possible definitions of such baselines exist (e.g. past,

²³ One case of such a clear link was the Swiss Climate Cent, a private levy, which only emerged because of the threat of governmental action.

²⁴ If a conservative baseline for “mobilisation” is chosen, the current level of carbon market payments has to be deducted as it emerged because of Kyoto and not of Copenhagen. However, one may also argue that without any post-Kyoto agreements, the carbon market may even collapse, so following this argument all carbon market payments are arguably “mobilized by governments”.

current or planned climate or development funds) and none of them is internationally accepted (Brown et al., 2010; Stadelmann et al., forthcoming). As no baseline has been agreed for public finance, we can also not judge on the additionality of private finance, and will therefore, not include this criterion in the further analysis. Clearly, if there is international agreement on a public climate finance baseline, this would have to apply to private finance as well.

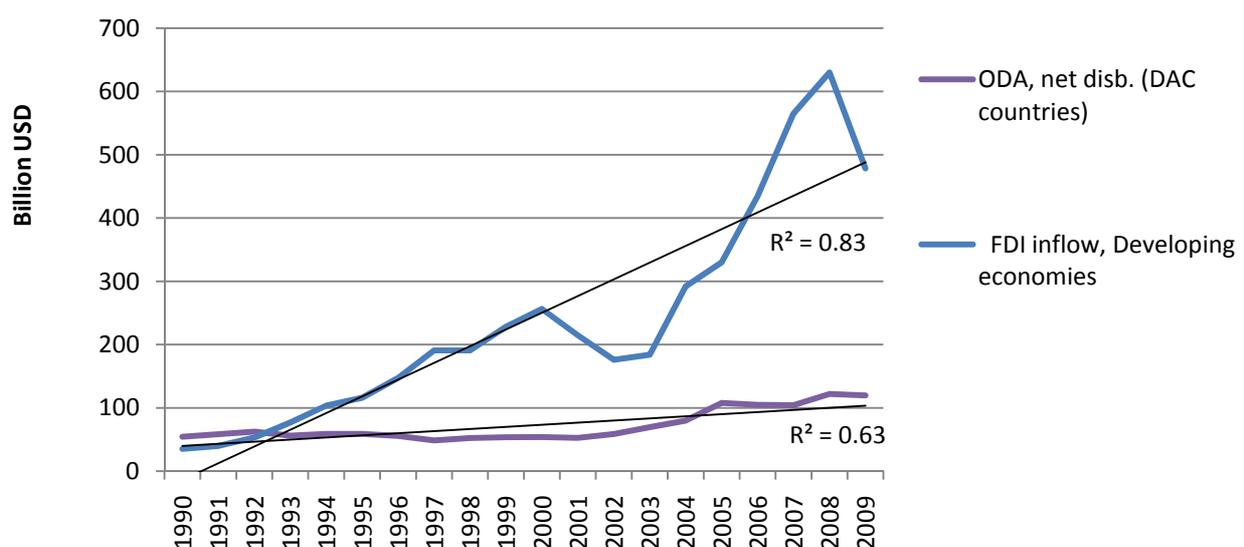
Predictability

Predictability of climate finance may be fulfilled if expectations of funding flows are met. Evaluating expectations is difficult, but we can assume that developing countries expect flows to be steady or steadily increasing. We will, therefore, assess different private financial flows according to those two criteria.

Predictability requires steadiness, or at least a consistent trend. This can be assessed by looking at the variance of financial flows over time. In statistics, we use the “coefficient for variation” as a normalized indicator for variation. The “coefficient for variation” is defined as the standard deviation of a variable divided by its mean. Table 2 shows the variation coefficient for different funding types. For making variance comparable, we assessed the variance in the last 6 years where data was available. We rate a “coefficient of variance” of less than 33% as *predictable*, which is the case for FDI, investment leveraged by public agencies, migrant remittances and private donations. This level of less than 33% variation is clearly something that should be decided as part of the negotiations, as some planning efforts may require greater or lesser levels of certainty of funding inflows. In case of carbon market investments and “other investments”, the coefficient is higher than one unit (100% variability), meaning that the standard deviation is higher than the mean, which we rate as *unpredictable*. The other funding flows are rated as partly predictable, falling somewhere between the two.

The second possibility for predictability is a steady increase, which can be interpreted as a linear increase of funding over time. For assessing if a linear increase is given, we have conducted simple ordinary-least-square regressions with the funding flow as independent and the year as dependent variable (see Figure 4 showing the increase of ODA and FDI as illustration). The resulting coefficient of determination (R^2) indicates which percentage of the variation in the financial flows can be explained by the variable time. Again, Table 2 shows the resulting coefficient of determination for different flows. Almost all private flows have a coefficient above 0.63 - the corresponding coefficient of determination for ODA, which we use as benchmark – and are rated to have a moderately predictable increase. Only “other investments” show a very low coefficient of determination and are rated as “unpredictable in their increase”.

Figure 5: Predictability of increase in (general, not just climate-related) ODA and FDI in the last 20 years.



Source: OECD (2011b) for ODA and UNCTAD (2011) for FDI

As a last step, the two indicators are aggregated to a compiled rating for predictability. Private flows with predictability in both indicators are rated as predictable [✓], while flows with one positive value are partly predictable [(✓) or (×)] and flows without any positive value are rated not predictable [×].

Table 2: Predictability of different funding flows

	Measure, data source	Range of annual flows (\$ billions)	Coefficient of variation (st. dev / mean)	Coefficient of determination linear regression; flow = f(time)	Rating for Predictability
Comparison: ODA	Net ODA, DAC donors	80-122	✓0.14	✓0.73	✓
Investments (all, not only climate-friendly)					
- For. direct investment (BAU)	FDI (UNCTAD)	292-630	✓0.29	✓0.64	✓
- Other investments (BAU)	Private portfolio (IMF)	-58-120	×2.59	× 0.08	×
- Leveraged by public agencies	ODA/OOF (OECD)	90-180	✓0.23	✓0.65	✓
- Leveraged by carbon market	Investments (URC)	1-59	× 0.91	✓0.91	(×)
Carbon credit payments (all)	Issued credits (URC)	0-1.8	(×)0.71	✓0.86	(✓)
Voluntary funds					
- Migrant remittances	All (UNCTAD)	173-297	✓ 0.15	✓0.90	✓
- Private donations	OECD	15-22	✓ 0.27	✓0.89	✓
- Voluntary offsets	OTC, Hamilton 2010	0-0.3	(×)0.70	✓0.85	(✓)
- Corporate initiatives	N/A	N/A	N/A	N/A	
- Payments for products	N/A	N/A	N/A	N/A	
- Private GHG levies	N/A	N/A	N/A	N/A	

\$ in current prices. Analysis is conducted for the last 6 years where data was available. . For most variables, the 2004-2009 figures were taken; for carbon market flows and investments, migrant remittances and voluntary offsets 2005-2010 figures were taken. For investments leveraged by the carbon market, investments are subsumed by year of registration

Basic equity (no net incidence and finance for the most vulnerable countries)

Equity considerations are at the core of climate finance negotiations. In our “basic equity” criterion, we do not include the main contested equity issues such as the total amount of climate finance needed, or the exact allocation of funding among different parties, as these are extremely complex issues and are very difficult to assess on an objective and summary basis for this number of financial flows (we encourage further research on these points). We, however, see two issues to be particularly important for assuring minimal (“basic”) equity: no net incidence and funding for the most vulnerable.

First, is there any net incidence of some private finance for developing countries? The “no net incidence” (or no net cost burden) criterion has been introduced by the UN High-level Advisory Group (UN, 2010c), as international transport levies may imply funding requirements for developing countries²⁵. At first sight, no general net incidence can be found for any types of private finance²⁶. However, some privately financed climate finance programmes may have negative impacts (e.g. economic, environmental). Therefore, exclusion of finance flowing to specific projects where environmental and social safeguards are not met (e.g. nuclear power, unsustainable palm oil production, some large hydro not meeting the standards of the World

²⁵ While all countries may have to contribute to burden sharing, most countries not included in Annex-1 of the UNFCCC (the exception are few richer countries like Korea, Mexico, Singapore and Venezuela) should receive net funds, when looking at common burden sharing principles (see e.g. Dellink et al., 2009).

²⁶ Some private flows (e.g. investments in large-scale hydro) may have net negative (social, environmental and(economic impact but no flow type *per se* implies net incidence.

Commission on Dams, those not meeting basic ILO labour standards) may be warranted. We conclude that none of the listed types of private funding violates the “no net incidence” criterion a priori, while specific projects may have to be excluded. Certainly usurious loan rates and profiteering schemes that leave little value in the host country will have to be watched out for in some of these categories.

Second, is private finance also flowing to “countries that are particularly vulnerable”, as to be taken into account for longer-term finance according to the Cancun Agreements? Generally, all these private funds are flowing into all developing countries, but carbon market flows, payments for products and investment flows have been less focused on least developing countries (LDC), which are normally seen as most vulnerable (see Table 3). Only private donations reach the share of LDC population (roughly 15% of total non-annex-1 population, see World Bank, 2001a), which we rate as “fully fulfilling” the basic equity criterion. Even public climate-coded flows only have a share of 7 % flows to LDCs (with ODA being at 11% and OOF at 0%). We rate investments leveraged by public flows as well as migrant remittances with a similar as partly fulfilling the basic equity criterion.

Table 3: Share of flows to LDCs

	Flows to DCs	Flows to LDCs	% to LDCs	Data	Data source
Climate friendly investments					
- For. direct investment (BAU)	455	22	(×) 4.9%	All (not only climate)	UNCTAD (2011)
- Other investments (BAU)	82	0.04	× <0.1%	All (not only climate)	World Bank (2011b)
- (Leveraged by) public flows	4	0.3	(✓) 7.3%	Climate-coded ODA/OOF	OECD (2011a)
- Leveraged by carbon market	23	0.07	(×) 0.3%	Registered projects	URC (2011)
Carbon credit payments (all)	6	0.02	(×) 0.4%	Expected credits (ti11)	URC (2011)
Voluntary funds					
- Migrant remittances	223	17	(✓) 7.6%	All (not only climate)	UNCTAD (2011)
- Private donations	~35	~11	✓ ~35%*	US donations	Hudson (2011)
- Voluntary offsets	-	-	(×) 1%?*	Credits sold	Hamilton (2010)
- Corporate initiatives	N/A	N/A	N/A	N/A	N/A
- Payments for products	5207	209	(×) 2.5%	All merchandise exports	UNCTAD
- Private GHG levies	N/A	N/A	N/A	N/A	N/A
Benchmarks					
<i>net ODA (DAC countries), \$ billion</i>	<i>81</i>	<i>20</i>	<i>24.9%</i>	<i>2004-2009 average, all</i>	<i>OECD (2011a)</i>
<i>Population 2009 (billion inhabitants)</i>	<i>5.5</i>	<i>0.8</i>	<i>15.1%</i>	<i>2004-2009 average, all</i>	<i>World Bank (2011b)</i>

*Numbers for private donations are given for Sub-Saharan Africa, which hosts most LDCs and has similar ODA figures than LDCs

** Share of transactions to Africa is 10%, which is triple the share of funds in the CDM. Triple the CDM share is roughly 1%

Flows are Data years: average for 2004-2009; except 2005-2010 for carbon market and merchandise export; 2009 data for voluntary offsets and private donations

As no type of private fund implies net incidence per se, we judge the “basic equity” criterion according to the rating we have just conducted, based on the share of flows to least developed countries.

No double counting with Annex-1 emission targets

The criterion of “no double counting with Annex-1 emission targets” can be justified as follows; the \$100 billion figure was mainly promised by industrialized countries as part of a package including mitigation commitments by developing countries in Copenhagen. Those mitigation commitments by developing countries, also termed “nationally appropriate mitigation actions” (NAMAs) had been agreed back in Bali, under the condition that industrialized countries provide financial and technological support (UNFCCC, 2008b). Therefore, one may argue that the mitigation part of the \$100 billion is meant to help developing countries in implementing their NAMAs or in other words, their own emission reductions. Therefore, the \$100 billion is not meant to include flows that industrialized countries need to fulfil their own emission

reduction obligations under the international agreements; counting financial flows towards the \$100 billion figure and using it to fulfil emission targets, can therefore, be seen as “double counting”.

Most private flows do not lead to double counting; the only exception are “carbon market payments” (and as consequence also funding leveraged by the carbon market). Counting carbon market flows as part of the \$100 billion target would clearly constitute a case of “double counting” as the same financial flows are used by industrialized countries to buy emission reductions credits for complying with international emission targets. The only carbon market payment not clearly implying “double counting” are payments beyond the carbon market price, as it can be argued that complying with emission targets does not require those payments above market price, which support more expensive technologies such as solar energy that may help developing countries to harvest cheaper reductions in the longer term.

Addressing barriers / enabling mitigation and adaptation

Another potential criterion, not yet discussed in the literature, is “addressing barriers”, which is reasonable as climate finance is intended to remove financial, technology, informational and institutional barriers²⁷ to enable climate change mitigation and adaptation (see Painuly, 2001; Boldt et al., 2010 for such barriers). If financial flows are not removing barriers but are only flowing because those barriers are removed by other financial flows or means, then their inclusion in the \$100 billion figure is doubtful. Funding flows which are not removing any barriers do hardly serve the needs of developing countries, as specified in international agreements.

When assessing different types of payments, then voluntary funds and carbon market payments clearly (intend to) address barriers for climate change mitigation and adaptation. However, private investments themselves are not addressing barriers; either they are flowing because the risk-return ratio is beneficial enough without any climate policy intervention or the investments are undertaken because returns have been increased and/or risks have been reduced by public sector interventions. Apart from private investments, also infra-marginal rents in the carbon market do not necessarily address barriers as they may merely form profits for traders and brokers. However, such rents may also provide dynamic incentives for new actors to enter the carbon market (Hepburn, 2009), which in itself may constitute a barrier removal.

Data availability (current and potential)

As seen in the first section, data is not available for all types of finance; especially private finance and some investment flows are not well tracked. However, data improvements are possible for most private flows. Low-carbon FDI could be determined in more detail, governmental agencies may be obliged to report on leveraged private finance, carbon market flows can be assessed in more detail if needed, and also private donations and payments for products can be analyzed regarding their climate benefits. Therefore, an acceptable data quality can be achieved for all types of private flows except for “other investments” and “migrant remittances”, where data is much aggregated so climate-friendliness is very difficult to assess.

Social and economic benefits for host countries: Parties need to decide whether the broader social impact of private flows may be part of the consideration here: Do they contribute substantially to human needs like providing light, education, health, employment, etc.? Do they increase inequality or provide ladders for unskilled workers? Do they build state capacity to regulate and help industry, or are they part of corruption problem and undermine state by strengthening corporate lobbying groups? Alternatively, do they bring international norms of concern for environmental protection to the business sector in these nations? While this is for further discussion, we do not qualify different funding flows on this criterion here because, first, exact definition of the criterion will be debated and, second, differences will rather be within than between different types of private flows.

²⁷ Some examples for such barriers are higher costs of a technology or higher risks (financial/investment barriers), the need to build infrastructure, e.g. extended electricity grid for renewable energies or natural gas pipelines (technological barrier), missing awareness that low-cost (or net cost saving) technology is available (informational barrier), and bureaucratic procedures, weak institutions or unsustainable policies (regulatory or institutional barriers).

Overview of private flows evaluated according to different criteria

Table 4 gives an overview on how different private flows perform on different criteria for inclusion in the \$100 billion promised at Copenhagen and Cancun for new and additional climate finance. No flow fulfils all criteria, while every fund meets at least two of them. If we take the three principles of mobilization by governments, predictability and basic equity, which can be derived from the Cancun Agreements, then only finance leveraged by public agencies, some payments for carbon credits and private GHG levies fulfil all of these basic criteria at least partly. Finally, if we set "addressing barriers" as additional criterion, then only carbon credit payments above market price and private GHG levies (if mobilized through public pressure) can fulfil all these basic criteria.

Those two types of flows fulfilling all criteria currently only account for less than \$0.15 billion per year (see Table 1). It is clear that most Parties (especially developed country Parties) certainly had more private finance in mind, when agreeing to the \$100 billion figure. Therefore, further political agreement is needed on which criteria are more relevant than others in deciding which finance should count in meeting these promises. If for example "addressing barriers" is excluded as a criterion, the amount of private finance as part of the \$100 billion is increased to \$20-110 billion currently (as funding leveraged by public agencies are included). In this case, we clearly need better-defined calculation methods for leveraging private finance and increased data quality. Furthermore, a more conservative methodology (e.g. only North-South flows or assuming a certain percentage of non-additional projects) may have to be applied so that leveraged private finance does not already exceed the \$100 billion limit by themselves.

Table 4: Types of private climate flows assessed against criteria for inclusion in the 100 billion \$ figure

Possible criteria →	Mobilization by governments	Predictability	Basic equity; finance for LDCs	No double counting w. targets	Addresses barriers	Data (current-> potential)
Type of fund ↓						
Climate friendly investments	x/✓	(x)	(x)	✓/x	(x)	(x)->(✓)
- For. direct investment (BAU)	(x)	✓	(x)	✓	(x)	(✓)
- Other investments (BAU)	(x)	x	x	✓	(x)	(x)
- Leveraged by public agencies	✓	✓	(✓)	✓	x	(x)->(✓)
- Leveraged by carbon market	✓	(x)	(x)	x	x	✓
Carbon credit payments (all)	✓	(✓)	(x)	x	✓	(✓)->✓
- For abatement costs	✓	(✓)		x	✓	(x)->(✓)
- For transaction costs	✓	(✓)		x	✓	(x)->(✓)
- For infra-marginal rents	✓	(✓)		x	(✓)	(x)->(✓)
- Above market price	✓	(✓)	(✓)*	(✓)	✓	(x)->(✓)
Voluntary funds	(x)	?	(✓)	✓	✓	(x)->(✓)
- Migrant remittances	(x)	✓	(✓)	✓	✓	(x)
- Private donations	(x)	✓	✓	✓	✓	(x)->(✓)
- Voluntary offsets	(x)	(✓)	(x)	✓	✓	(✓)
- Corporate initiatives	(x)	?	?	✓	✓	x->(x)
- Payments for products	(x)	?	(x)	✓	✓	(x)->(✓)
- Private GHG levies	(✓)	?	?	✓	✓	(x)->(✓)

✓ = fulfilled, ✓ = partly fulfilled, (x) partly not fulfilled, x not fulfilled, * payments above market price may help to promote more expensive projects in LDCs. Therefore, they may rather fulfil the basic equity criterion.

Conclusions

Private climate flows are mainly economically important, as they will represent the majority of financial flows needed for low-carbon and climate resilient development. Furthermore, they are also politically important, as industrialized countries have committed to the goal of “jointly mobilizing” \$100 billion of public and private finance to developing countries, annually, by 2020. With the total of all official development assistance (ODA) in all sectors being around \$150 billion a year, and climate finance from governments totalling something around \$10 billion a year, it is clear that private funding is going to end up being a substantial part of how this promise is met.

Despite the increasing awareness of its importance, tracking of private climate finance has hardly been studied. Existing studies have mainly identified open questions: the definition of what private climate finance actually is, the availability of data (thought to be improvable), systems for tracking private flows (including the question which institutions are to be involved), and finally the main issue: which types of private finance is to be included in the 100 billion \$ by 2020 figure. This paper has explored all of these main questions, attempting to synthesize and weigh the options and challenges.

Types of private climate finance and availability of data

As there is no common definition of private climate finance, we have moved beyond the commonly discussed private finance flows, FDI and CDM, and have analyzed all possible types of private finance, which can be classified into three main types: investments, carbon market payments and voluntary funds.

Investments are certainly the most discussed private climate financial flow, which mainly relates to their size: North-South low-carbon investments are thought to be in the range of at least \$30-40 billion a year, with foreign direct investments (FDI) being the largest part. Private investments leveraged by Northern governments' actions for climate-friendly programmes in the South may even be larger: we estimate those leveraged investments to be in the range of \$35-120 billion, whereas part of this is already captured by low-carbon FDI. The wide range of this estimation shows that data quality is quite low; the estimate given here is mainly based on reported climate-friendly public funds and the sketchy data on leverage ratios (private investment to public finance). The only figure for “leveraged finance” with an acceptable quality is the one for carbon market investments, which is in the range of \$15-30 billion per year. Apart from the needed improvement of data quality, the definition of climate investment flows is to be further clarified; distinctions exist between gross and net investments, North-South and leveraged investments, and total vs. incremental investments.

Carbon market payments (North-South) are also seen as important private sector flow but are actually below \$2 billion a year. Higher figures either refer to investments leveraged by the carbon market or forward contracts for carbon credits, which are both not to be mixed up with actual payments. Regarding data quality, the number of credits is exactly known, while the price per credit can only approximately be estimated using proxies for confidential primary market prices and publicly available secondary market prices. Normally, carbon market payments are analyzed as a whole but payments can actually be split into different parts: payments for abatement costs, transaction costs, infra-marginal rents and payments above market price. This distinction may be interesting, as it allows us to include part of carbon market payments into the \$100 billion figure, rather than all or nothing. Finally, carbon market payments are by no means only private, as many credits are bought by public entities. Including public and private carbon market payments in one figure may make sense for accounting purposes in the future, as long as those payments are not accounted as public climate finance.

Finally, voluntary funds have rarely been discussed as private climate flows, although they may reach the billions of dollars. Among voluntary funds with potential climate relevance we find migrant remittances (\$150-200 billion per year), private donations (\$50 billion), payments for climate friendly products and corporate initiatives (the scales of both are unknown). The only voluntary funds where annual climate-friendly payments are known are voluntary offsets and private levies for climate finance, both of which are relatively small (together summing about \$0.25 billion per year). Assessing climate relevance of the other, far higher flows is challenging but should not be ruled out, given their importance. Estimating payments for climate friendly products may be particularly important: industrialized countries consume more and more

products from developing countries; the increase in imported “embodied” emissions does offset the emission reductions achieved through the Kyoto Protocol by far.

A system for collecting, reporting and analyzing data

Past studies have already concluded that a system for collection, reporting and verification of private climate finance has to be elaborated. Buchner et al. (2011) proposed two possible systems: one driven by national communications made under the UNFCCC directives, and a more decentralized one using existing international agencies. We prefer the latter, where international organizations (such as UNCTAD or the OECD) have an important role in monitoring and reporting for their parts of the puzzle. These organizations are qualified to do this, as they have existing data collection systems and decades of experience providing data that is comparable across nations. In our view, individual countries could rather provide complementary information through their national communications. Not having national ownership over data collection and reporting may be a challenge from a sovereignty perspective, but countries may agree to delegate tracking to international organizations like UNCTAD, as it enhances efficiency and comparability. In any system, the UNFCCC will have to step up and play a leading role, defining where standards and methods for tracking and analysis, and facilitating the kinds of collection and analysis systems for Parties to evaluate whether the Copenhagen and Cancun pledges have been met. The UNFCCC COP may delegate part of these tasks to its subsidiary bodies, the secretariat (e.g. synthesizing information) or the new Standing Committee (e.g. elaboration of methods for tracking and analysis). These in turn may look to other agencies or private/non-profit centres for capacity to carry out the job. Another function of the UNFCCC may be to provide guidance and support to international organizations, governments and private actors reporting on private climate flows.

The main challenges we see in tracking private climate finance are agreeing definitions and standards of reporting and collecting, the avoidance of overlaps in data collection and accounting (the risk of double counting certain flows is high), the confidentiality of some private sector data, the question of whether the authority of the COP is guaranteed in requesting key data, and the speed of reporting and release of data. A system with clear tracking and verification rules set by the UNFCCC, trusted, empowered and resourced data collection institutions, and regular (but not too frequent) reporting requirements will help the world community meet this challenge.

Inclusion in the \$100 billion figure

As analyzed in the first section, climate-friendly private flows may already exceed \$100 billion today, if we include all finance flowing North-South or being invested in developing countries as consequence of incentives or actions by industrialized countries. The promises of “jointly mobilizing” \$100b/y in “new and additional” climate finance would need to be above these existing levels. If existing flows are to be counted, some flows have certainly to be excluded for making the target of \$100 billion of public and private finance meaningful. Which types of finance are to be included? Possible criteria are additionality, predictability, and basic equity (no net harm to poor countries and finance to the most vulnerable), which can all be derived from international climate agreements. Further criteria we used for the analysis are “no double counting with targets”, “addressing barriers” and “availability of data”. When using all these criteria, only two types of private finance would be eligible: carbon market payments above market prices and private levies for private finance (if set up to avoid governmental actions), which amount to less than \$0.15 billion p.a. at the moment. Clearly, negotiators had more private flows in mind, when setting the \$100 billion target. So which criteria to exclude? If we exclude “no double counting with targets”, then all carbon market payments would be part of the \$100 billion. If we exclude “addressing barriers”, most investments would be counted, but then the “private climate finance” figure may already reach the \$100 billion target on its own, and only new and additional finance above those current levels should be counted.

Therefore, clearly a political decision is to be taken on the selection of criteria for inclusion. Reaching a private finance figure that still requires an achievable increase of public funds to reach the \$100 billion would be most beneficial for climate policy; too few private finance included will risk to make the target of \$100 billion unachievable, while counting too many private finance will remove pressure from industrialized countries to provide further resources, and leave the pledge without any political meaning.

Final remarks: when is tracking private finance useful?

In the end, the financial resources needed for tracking of private climate finance can only be justified if we can clearly set out the reasons for it. There are potentially three reasons: enhancing transparency, proving access to finance and stimulating learning. First, tracking of climate finance will enhance transparency. If the funding types to be included in the \$100 billion are clearly defined, then tracking of these types helps to show to what extent the target is achieved. If no definition is agreed upon, then tracking of the largest flows may be justified to complement the overall climate finance picture, while reporting of the smaller flows would be voluntary. The second reason may be access to finance. While pure climate finance numbers may not help countries in accessing private finance, more extended information, like success stories on how foreign investment has been attracted, may be more beneficial. The third reason for justifying tracking is learning. For instance, the amount of leveraged private investment may be an indicator of its effectiveness, which is however a challengeable assumption, as we have shown in another working paper (Stadelmann et al., 2011).

Summing up, there are some reasons for tracking climate finance: transparency, access to finance, and learning. The strongest reason of keeping track of private climate finance is that private finance is included in the \$100 billion promise; for assessing compliance, clear definitions and information systems need to be agreed under the UNFCCC and the private finance covered by the definition is to be monitored and verified.

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