CLIMATE POLICY INITIATIVE

Supporting the Momentum of Paris: A Systems Approach to Accelerating Climate Finance

Padraig Oliver
Bella Tonkonogy
David Wang
Xueying Wang

Synthesis Paper

Descriptors

Sector	Climate Finance
Region	Global
Keywords	climate finance, systems thinking, networks, public finance, private finance, development
Related CPI Reports	Supporting the Momentum of Paris: A Systems Approach to Accelerating Climate Finance (Synthesis Paper)
	A Systems Approach to Accelerating Climate Finance: Needs and Actor Analysis
	A Systems Approach to Accelerating Climate Finance: Exploring Methods and Approaches to Systems Thinking in Climate Finance
Contact	Padraig Oliver padraig.oliver@cpiclimatefinance.org

About CPI

With deep expertise in policy and finance, CPI works to improve the most important energy and land use practices around the world. Our mission is to help governments, businesses, and financial institutions drive growth while addressing climate risk. CPI works in places that provide the most potential for policy impact including Brazil, Europe, India, Indonesia, and the United States.

Executive Summary

On November 4 2016, the Paris Agreement entered into force. To date, 190 countries have submitted 164 nationally determined contributions (NDCs) outlining their own goals and methods to reduce emissions in common effort to limit global temperature increases this century.

In maintaining momentum after Paris and NDC implementation, more onus will be placed on international public finance actors – bilateral aid agencies, export credit agencies, bilateral development banks, multilateral climate funds, and multilateral development bank – scaling up their own flows while using money most effectively to leverage others; coordinating and collaborating on approaches and avoiding duplication; as well as reconciling mandates on climate finance delivery with other mandates on poverty alleviation and the Sustainable Development Goals (SDGs).

Optimizing the use of international sources of public climate finance requires recognition of existing and emerging actors' inherent constraints, the capacity and needs of developing country systems to absorb finance, and a long-term view of how circumstances change in uncertain economic and political environments.

Systems thinking approaches provide the potential to identify and measure how international public climate finance actors can interact:

- With each other, given their own perspectives and constraints on what they can do, their future direction of travel, and direction of their peers.
- With developing country financial systems, given emerging trends in green finance across the developing world, potentially unlocking new sources of finance.

The systems approach frameworks developed in this project offer methods to enhance coordination and collaboration among actors both within the international public climate finance system, and during design of interventions within developing country contexts.

The graphic overleaf provides an overview of needs and gaps drivers across developing countries, against the drivers of public finance actor perspectives.

1. While specific systems and needs are best evaluated on a country by country basis, **short-termism, growing risks and volatility are prevalent across developing country financial systems,** impacting currency risk evaluation and potential public support for climate policies.
2. **Access to finance, the costs of and suitability of current financial products, and lack of tools and methods to enact low carbon and climate resilient projects remain the key barriers to climate finance growth**. Political and policy risks in the domestic environment are also cited as a key barrier to address in supporting private finance solutions.
3. The **most prevalent instruments and solutions identified include blended or structured finance vehicles, utilising concessional finance;** de-risking instruments such as guarantees or insurance; the provision of data and tools to manage uncertain risks; and policy support and technical assistance to reduce or manage political risks.

However, while such solutions are commonly called for, delivering them at scale require some of the major public finance actors in climate finance to adapt and change business models.

International Public Actors have been constrained by:

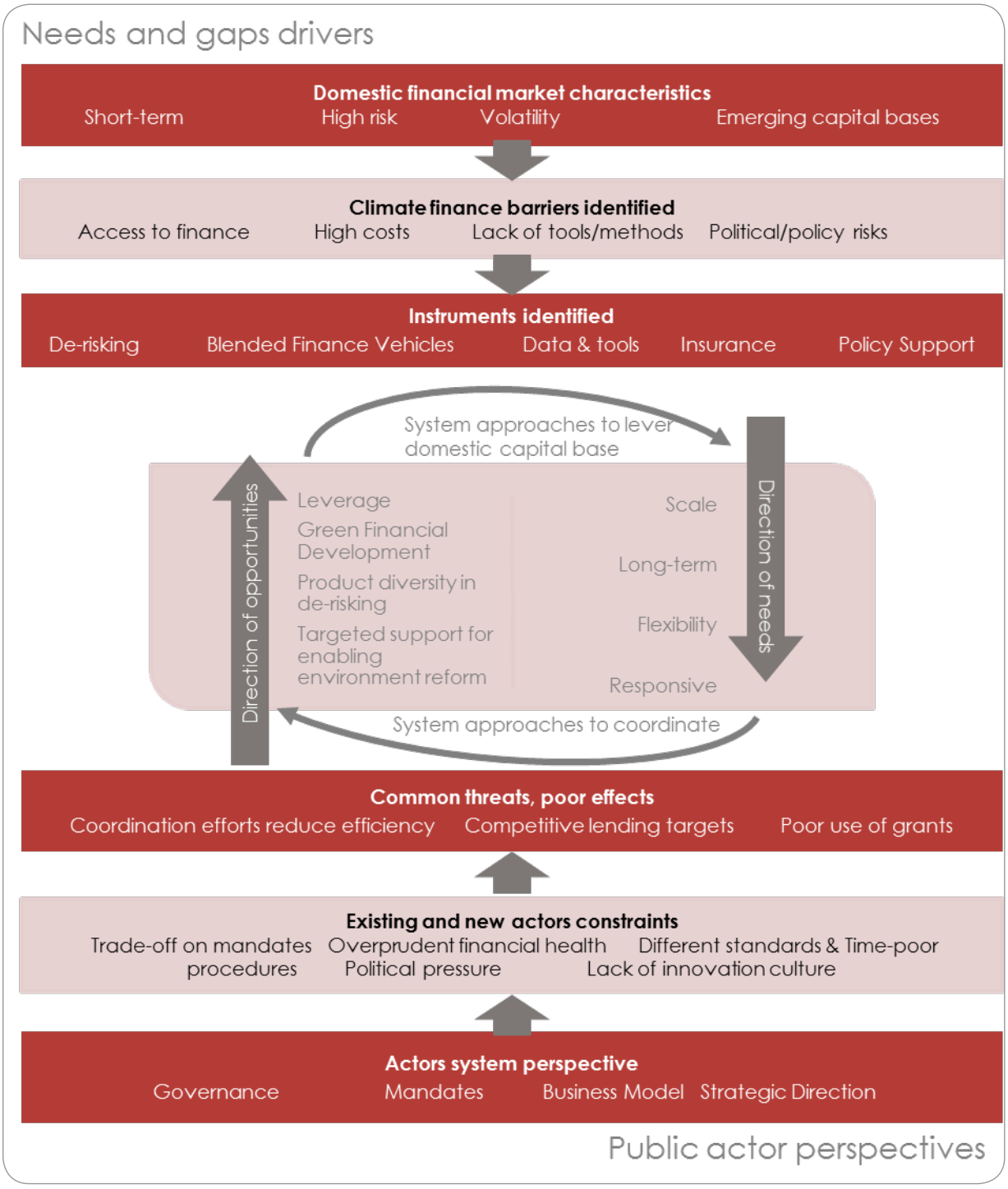
- Perceived trade-offs in meeting multiple mandates on poverty alleviation, development and climate change, creating silo effects within organisations and budget lines.
- Over-prudence in leveraging capital against healthy balance sheets. While recent efforts have leveraged greater amounts of capital, current risk ratios by some actors, particularly some bilateral development banks, are over-prudent.
- Lack of linkages on use of grant capital in combination with domestic policy or enabling environment risk reduction due to lengthy procedures, political pressures or lack of innovation culture in some institutions. This constraint may be reinforced by sources of concessional capital being bottlenecked in key 'connector' institutions such as the GCF.

International Public Actors are best positioned to:

- **Scale up blended finance and risk mitigation instrument offerings** in line with a more flexible capital raising strategy.
- **Harmonize existing procedures and standards, including through coordination with new institutions.** AIIB and NDB, as well as sub-regional and smaller national development banks, can learn from MDBs to set targets, harmonize accounting, and mainstream climate into their existing product lines.
- **Shift climate finance modes from project finance focus to financial system development focus**. So far, there is little effort to support mainstreaming of climate change into financial system development activities; most climate activities have focused on project finance. Our analysis has shown that broader system actors may impact the effectiveness public climate finance flows through:
  - » New regulatory actions for banks and the domestic institutional investments,
  - » Increased information flows through disclosure on ESG risks from service providers, and
  - » New mandates for green debt and equity investments by investors

In light of not only the scale of climate finance needs, but also the type of public finance instruments needed to leverage private flows, the importance of more connected coordination and collaboration by international public climate finance actors is crucial. Systems thinking approaches support the recognition of the effects of existing and new actors on scaling overall flows and their direction of travel, as well as support the collective optimisation of public finance interventions to achieve the scale needed – helping to understand not only the specific niche of each actor, but also how actors can most effectively coordinate and collaborate to achieve enduring impact.

Figure ES1: Overview of key needs and solutions in coordination and collaborating on climate finance delivery



1. Introduction

On November 4 2016, the Paris Agreement entered into force. To date, 190 countries have submitted 164 nationally determined contributions (NDCs) outlining their own goals and methods to reduce emissions in common effort to limit global temperature increases this century.[1]

In order to maintain the momentum of the Paris Agreement, international public finance flows need to be optimized to support the shift of global and national financial systems to align with NDCs and ultimately to the scale required to address climate change.

In maintaining momentum after Paris and NDC implementation, more onus will be placed on international public finance actors—bilateral aid agencies, export credit agencies, bilateral development banks, multilateral climate funds, and multilateral development banks—scaling up their own flows while using money most effectively to leverage others; coordinating and collaborating on approaches and avoiding duplication; as well as reconciling mandates on climate finance delivery with other mandates on poverty alleviation and the Sustainable Development Goals (SDGs).

These challenges and ambitions are not new in climate finance nor are they undertaken in a static system. International public climate finance flows were USD 105bn over 2013-2014, approximately 25% of the total to and from within developing countries (Buchner et al 2015).

New development finance actors and sources of finance are emerging, just as more traditional sources are under pressure amid growing competition for public finance. Traditional intermediaries such as development banks also face demands to pull back from certain countries or sectors where incomes have risen and technologies are competitive, as well as provide more flexibility and predictability in their offerings to developing countries, while continuing to maintain healthy balance sheets.

Given these challenges, the need for new ways to optimally and effectively deploy public climate finance has rarely been more evident.

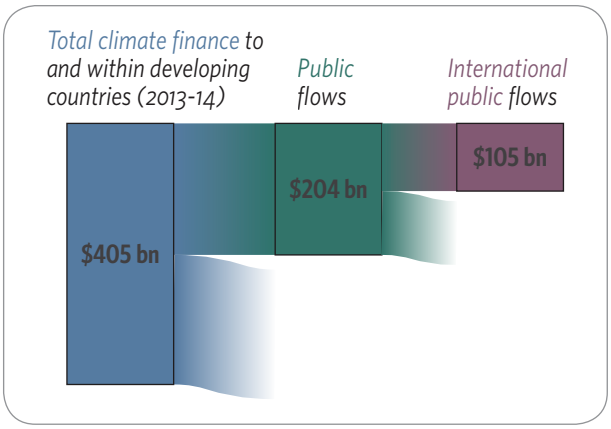
Systems thinking approaches provide the potential to identify and measure how international public climate finance actors can interact:

- **With each other**, given their own perspectives and constraints on what they can do, their future direction of travel, and direction of their peers.
- **With developing country financial systems**, given emerging trends in green finance across the developing world, potentially unlocking new sources of finance.

In this report, we outline the potential for systems thinking approaches across the international public climate finance system to assist in better coordination and collaboration actions. We look first at the current needs and system, and then consider systems approaches to scaling it up.

The findings are summarized from two working papers published concurrently which provide more background and analysis on the themes of the report.

Figure 3: Breakdown of climate finance flows to and within developing countries, 2013-2014



1 Latvia submitted an NDC on behalf of the 28 EU member states.

2. Reviewing the trends, gaps and needs

The following section reviews the trends, gaps and needs in the climate finance systems in order to understand the systems goal and features currently driving systems performance.

In terms of the climate finance system, its goal has been frequently articulated in terms of closing the investment gap required to fulfill a low carbon and climate resilient economy (NCE 2013; McKinsey 2016; UNCTAD 2014; UNEP 2016).

While studies on estimating investment needs and gaps in developing countries highlight major sectors in need of support, results vary significantly, from USD 18-36 trillion investment gap, particularly in power generation, transportation, and the water and sanitation sectors.

Broad global studies rely on technology, costs and demographic assumptions to arrive at potential investment figures. These can struggle to reflect the latest trends in both technology costs and finance flows in key developing countries that have an oversized effect on estimates.[2]

Box 1: Benefits and limitations of systems thinking approaches

Systems thinking methods are best applied with regard to complex problems that include establishing a goal, key actors, and a systems boundary. Different techniques of systems mapping include:

- **Actor mapping** visualizes key organizations that influence a system as well as their relationship to one another.
- Systems analysis **causal loop** diagramming and **stock/flow** dynamics make explicit the negative and positive feedback loops that may drive institutional behavior and outcomes.
- **Social network analysis** can measure the relative influence or connectedness of different actors in a system.

Capturing **perspectives** of different actors and methods to reconcile them to achieve a goal is a key benefit of systems thinking approaches. Whereas stakeholder analysis seeks to assess a group's ability to influence specific outcomes in order to produce a prioritized action plan, actor mapping explores the relationships and connections among actors and to a given intended outcome in order to identify ways to improve a system's performance.

Further, the exercise of mapping the system interactions may also provide value in solving complex problems that involve helping many actors see the 'big picture' rather than their immediate concerns. This can set a more nuanced framework for dialogue and for identifying priorities and leverage points to meet future needs. In particular, the largest benefit of systems mapping can often be in the process of developing the map when done in a participatory setting, allowing for all actors to visualize their current and possible future roles in the system.

The limitations to systems thinking include the need to revisit interactions and inter-relationships over time. The exercise is iterative in order to reflect new changes and trends as they develop. In this report we illustrate potential applications of these methods to climate finance flows analysis.

Source Gopal & Clarke 2015; Aronson 1998

2 For example, McKinsey (2016) noted a negative change in growth prospects for the Chinese economy out to 2030 would add USD 10 trillion to its investment gap estimates.

As developing countries begin to implement NDCs, greater detail and clarity on precise sector-based finance gaps that speak to potential investors will need to emerge as part of bottom-up, country-specific investment plans.

85% of developing countries have indicated that their NDC submissions require revision or clarification in terms of objectives, targets, developing policies, and gathering accurate data to estimate baselines for each of those activities (UNFCCC 2016).

The IFC (2016), analyzing both objectives within NDCs as well as broader national development plans and goals, identify an investment potential of USD 23 trillion out to 2030 in 21 middle-income countries.[3]

The inherent nature of financial systems in developing countries will be a key determinant in whether adequate levels of climate finance can be unlocked. Three features in particular may have a significant effect on the ability to scale up flows against NDC goals.

- *The financial systems of developing countries are dominated by banks that have short-term lending outlooks and growing systemic risks.*

  It is estimated that banks hold 85-90% of financial assets across developing countries, emphasizing the dominating role they play (UNEP Inquiry 2016a). Short-termism is also prevalent: from 2010-2012, 49% of loans had tenor of less than one year. Only 19% of loans in developing countries are over 5 years duration, compared to 33% in high income countries (World Bank 2015).

  Banks remain prone to sector concentration risk in many countries. Non-performing loans have spiked sharply in some countries since the commodity crash (EIB 2016). Banks in low income countries have seen a 44% compound annual growth rate in non-performing loans over the 2011-2016 period (Figure 4).

- *Yet, new sources of capital are emerging through domestic institutional investors.*

  The ratio of assets to GDP of institutional investors (insurance companies, mutual funds and pension funds) in developing countries grew by half in the period 2010-2014 from 22% to 33% (World Bank 2016).

- *Developing countries are also prone to volatile capital flows that can destabilize currencies and negatively affect overall growth prospects.*

  Government finances may deteriorate in order to cover debt denominated in foreign currencies, thereby placing long-term support for climate policies or subsidies under stress as well as affecting the attractiveness of investments for private investors (UNDP 2012). Volatility of capital flows remains a key concern in 90% of developing countries due to the effect it has on the exchange rate among other factors (IMF 2016c).

For public climate finance actors, these three factors underline the need for public flows to be long-term against short-termism, apply flexible instruments that can crowd-in growing domestic capital bases when available, and nimble in reacting to changes within the domestic financial context.

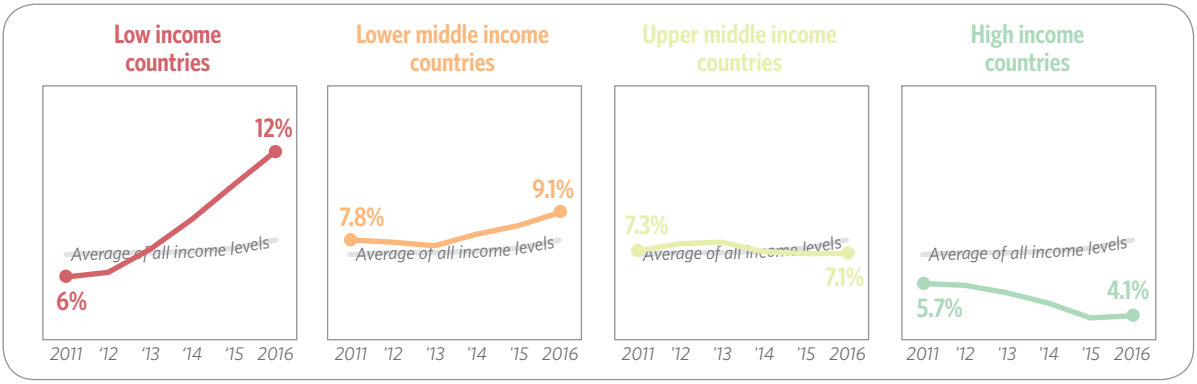
A conventional wisdom has emerged as to how and where public finance support should be best targeted. A UNFCCC survey of 79 developing countries on the type of support necessary for NDC implementation revealed several key national and regional priorities not as prominent as investment gap studies. While support for the renewable energy sector featured prominently across regions, waste and transport were priorities across Asia and West Africa; and forestry in East Africa and the Caribbean (UNFCCC 2016). Access to finance is generally seen as the most urgent need across all sectors, over capacity building and technical assistance.

The need to 'access finance' corresponds with the analysis of 132 eligible submissions to the Global Innovation Lab for Climate Finance and the Fire Awards over three cycles from 2014 to 2016 that targeted developing countries.[4]

3 USD 4 trillion across 11 key LMIC country markets, and 19 trillion across 10 UMIC markets out to 2030. Green buildings in China alone provide an estimated investment potential of USD 13.6 trillion out to 2030.

4 Each submission, crowd-sourced from entrepreneurs, financial institutions and academics active in climate finance, describes a distinct barrier to be addressed and a solution proposed including specific financial instruments and delivery models used to deliver the solution. The submissions provide a useful data source for understanding the major barriers and solutions as identified by the climate finance community in developed and developing countries. 73% of submissions were deemed as mitigation or primarily mitigation focused ideas, with the remaining 28% adaptation focused.

Figure 4: Growth of Non-performing loans against total assets by income group (IMF 2016a)



The most common barriers citied across 35% of ideas were both access to finance and skill gaps among investors. However, for adaptation focused ideas, barriers such as lack of suitable financial services and lack of data to assist investment decision making were most cited, by 42% and 36% of the ideas. These barriers also featured in mitigation focused ideas along with high costs of capital.

In general, mitigation focused ideas were dominated by structured funds or blended finance facilities where guarantees, grants and subordinated financial instruments were deployed to target private capital from institutional investors, commercial banks and corporations, in electricity and industry sectors.

For adaptation focused ideas, funds were also the majority of ideas however tools and services were more prominent targeting use of technical assistance and data provision to help investors and SMEs manage climate risks in agriculture, financial services (insurance provision) and water sectors. See Figure 3 for more information.

In the face of the significant investment gaps and support required by developing countries, public climate finance actors are expected to take on greater risks, and increase flexibility of financing provision as well as predictability of finance flows, to help attract and crowd-in private investment.

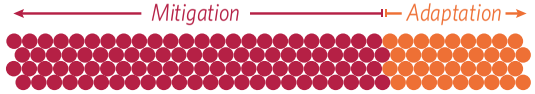
Using concessional public finance is key to unlocking sources of private investment by tackling market and institutional failures that prevent the deployment of capital. But the system may not be set up to facilitate these flows:

- In mapping sources and flows of concessional climate finance, Trabacchi et al (2016) found a need of USD 3.5 billion per year out to 2020 of externally sourced concessional finance in order to meet the climate finance goals of multilateral development banks (MDBs).
- The gap in total concessional finance may not only be restricted to absolute financial commitments, but also *where* the scale of finance is required by country and sector. Of 21 emerging market countries assessed by the IFC (2016) with a combined USD 23 trillion climate investment opportunity, only 5 countries have access to concessional finance through the International Development Association (IDA) arm of the World Bank. The remaining 16 countries across the LMIC and UMIC categories include the largest sources of both investment and mitigation potential, however are too developed to meet IDA eligibility requirements.[5] Here, the effects of barriers restricting private finance flows are therefore outsized due to the lack of internal concessional sources available to address them. Instead, external sources of concessional finance from multilateral climate funds are relied upon at the project level to catalyze or de-risk private investment, entailing transactions costs.

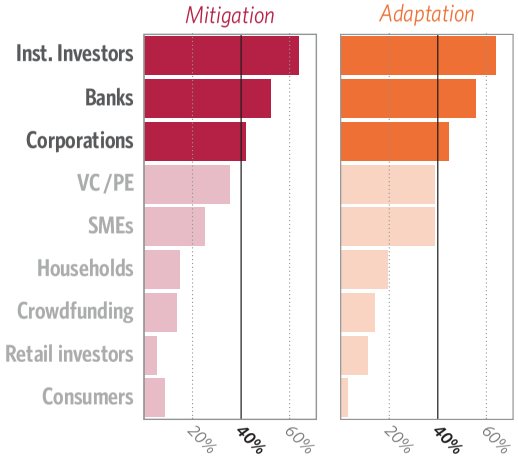
5 Countries with IDA access include Nigeria, Vietnam, Ivory Coast, Kenya and Bangladesh. Countries limited to IBRD financing include: 6 LMIC countries (Egypt, India, Indonesia, Morocco, Philippines, Ukraine) and 10 UMIC countries (China, Brazil, Argentina, Colombia, Jordan, Mexico, Russia, South Africa, Turkey, Serbia).

Figure 5: Most cited barriers to be addressed, delivery models for solutions and instruments to be deployed by Lab/Fire submissions 2014-2016 across mitigation and adaptation focused ideas, sectors, regions and sources of private capital.

Of 132 eligible ideas submitted to the Global Innovation Lab for Climate Finance and the FiRe awards over 2014-2016, 73% were focused on mitigation or primarily on mitigation and 28% on adaptation:

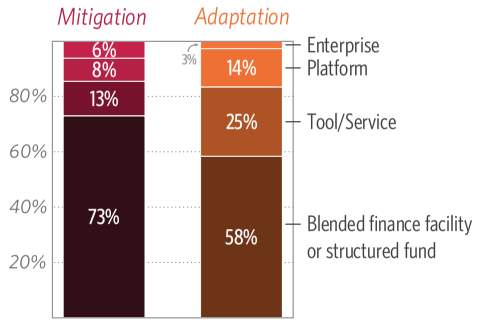


Over 40% of ideas targeted institutional investors, banks and corporations as sources of private finance:

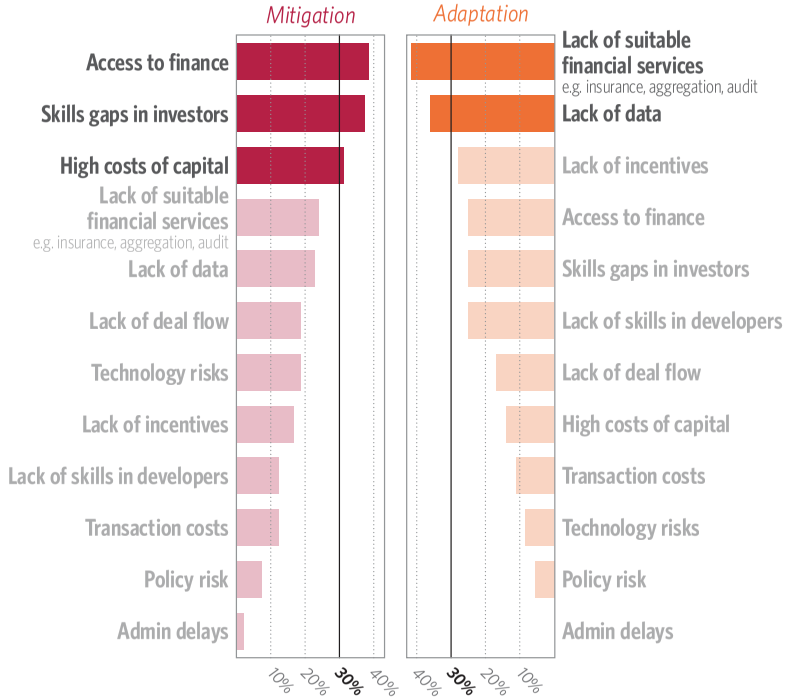


Share of ideas identifying each source of finance

60% of all the ideas were in the form of blended finance facilities or structured funds, although tools and services were more prominent in adaptation ideas:

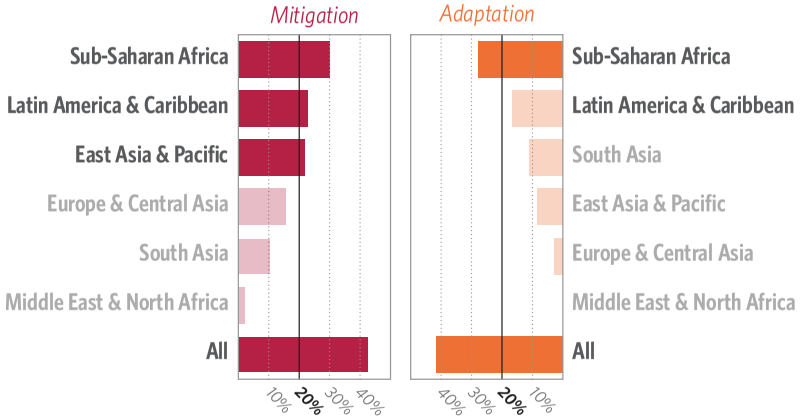


Financial barriers such as access, cost of capital, along with technical barriers such as skills gaps among investors were to be addressed cited in over 30% of mitigation ideas; whereas adaptation ideas focused mostly on lack of suitable financial services and data.

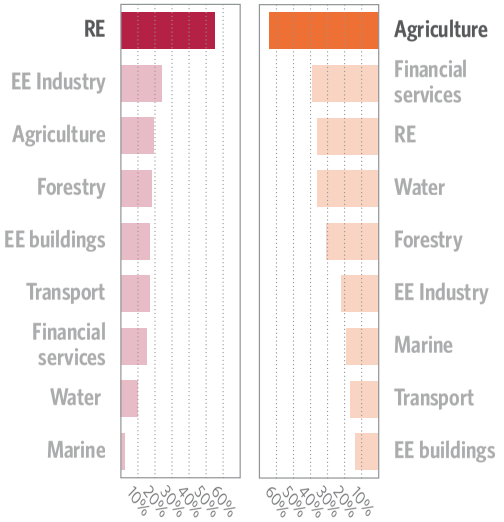


Share of ideas identifying each barrier

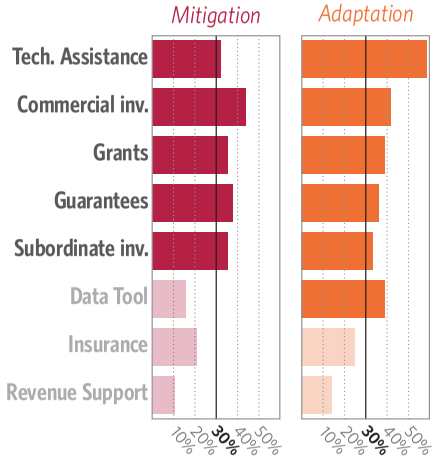
Countries and regions within Sub-Saharan Africa, Latin America & Caribbean and East Asia & Pacific received most attention.



Renewable energy dominating mitigation ideas with 55% of ideas targeting the sector, whereas agriculture was a key target for 64% of adaptation ideas.



The need for commercial investment, guarantees, grants and subordinate investment featured prominently across the ideas, technical assistance and data tools were instruments chosen to address adaptation barriers.



All figures represent % of 132 submissions where datapoint is mentioned.

3. How well placed are international public finance actors to respond to needs?

In order to understand how to meet climate finance needs in developing countries, it is essential to identify the comparative strengths of public financial actors in providing flexibility, predictability and risk coverage, and areas where these institutional are yet to optimize climate finance support. This section draws on SWOT analyses conducted for each of six public actor groups to identify strengths and internal and external threats to scaling up climate finance.

The international public climate finance system has been undergoing significant changes since before the Paris Agreement was reached in terms of ambition, scale, and new actors.

- *In anticipation of COP21 and the Paris Agreement, key multilateral development banks articulated a new set of goals* (MDBs 2016).

  Increases between 33% and 300% in annual climate financing by 2020 were announced by relative lending (ADB; AfDB; EIB; IDB), with targets of 28-40% of total lending by 2020 (AfDB; EBRD; EIB; IDB; WBG)

- *In addition to the new finance and development goals, organizations are focusing on increasing the amount of leverage they absorb to bolster their capacity to finance new development projects.*

  The Asian Development Bank (ADB), for instance, has moved to dramatically expand its lending capacity to poor countries which are likely to lack access to finance. Specifically, it has combined the lending operations of its Asian Development Fund (ADF) — which originally provided concessional loans for projects in poor countries (as opposed to ADB loans that provided market-rate loans to middle-income countries) with its ordinary capital resources (OCR), thereby tripling its equity base and allowing ADB to provide 40% more financing to developing countries.

  The World Bank Group's International Development Association (IDA) has also received AAA credit ratings and Board approval to allow it to access capital markets for the first time, potentially increasing leverage of donor resources to 1:3.

- *Important new development finance institutions have emerged as the Asian Infrastructure Investment Bank (AIIB) and New Development Bank (NDB) have committed themselves to climate finance mandates.*[6]

  AIIB's mandates include building a "Lean, clean, and green" organization – of which "green" means an institution built on respect for the environment. The Bank aims to assist clients in achieving their nationally determined contributions, including through mitigation, adaptation, finance, technology transfer, and capacity-building.

  The NDB has dual mandates of promoting infrastructure investment, and supporting sustainable development. The bank has started to engage in the climate sector in practice, with the first set of four approved loans totaling $811 million, all in the renewable energy sector.

  The ambitions of these banks, if realized, present new opportunities for climate finance. Both banks have large pools of initial authorized capital (~USD 100 billion), and focus on large infrastructure projects. They will provide finance in areas where existing banks such as ADB and WB would not normally enter, potentially increasing the scope of RE coverage.

  As newly established development finance institutions (DFIs), the banks aim to simplify procedures and cut administrative costs compared to existing banks, provide flexible lending terms to accommodate developing countries' needs, and commit to high operational standards with regard to environment safeguards and climate considerations in order to build a positive image in the international community.

- *With over $10.3 billion in commitments, the Green Climate Fund (GCF) has emerged as the largest multilateral climate fund by total committed assets.*

6 AIIB was formally established in 2016 to complement and cooperate with existing MDBs to fulfill infrastructure and other productive sectors' investment needs in Asia. There are currently 75 member countries. The NDB was created in March 2013 by Brazil, Russia, India, China, and South Africa. The bank is established as a response to the underrepresentation of the BRICS countries in existing international financial institutions.

The GCF has committed nearly $1.5 billion through three cycles over the past two years, out of the $10.3 billion that the fund intends to commit to projects through 2019. 50% of existing commitments have been to either transregional projects or projects located in Latin America and Sub-Saharan Africa. To date GCF investments have been concentrated in renewable energy generation, enhancing the resilience of agriculture and the built environment, and dual benefit/cross-sectoral projects.

We analyzed the activities of 30 key actors in the international public climate finance sector to take account of their current constraints and future direction, as well as how they compare to each other – a systemic perspective.

Our analysis focuses on the risk appetite, mandates, governance processes, and financial sustainability and independence (i.e. ability to raise capital) of representative public finance organizations across the six groups listed in Table 1, in order to capture their own systemic perspectives and highlight the constraints and strengths in meeting new demands placed on the climate finance system.

Common constraints or tensions inherent across actors providing climate finance include:

- **Perceived or real trade-offs among development, climate, and profitability:** Development and climate, while sometimes aligned, may not always be. For example, the largest greenhouse gas emitting developing countries are not the world's poorest, nor are they the highest recipients of concessional development aid. This debate has played out in particular in discussions of energy access and coal power financing in the context of MDB and bilateral DFI energy and climate policies.

  Development and climate align most readily in climate adaptation, as the poorest countries are often most vulnerable to changes in climate, due to existing fragility and typically higher dependence on natural resources.

  Development finance institutions have further reported tensions between development and profitability. This also affects climate finance as grant and concessional funding is increasingly targeted towards the poorest and most vulnerable countries, which, as above, are likely to have lower climate change mitigation potential (heavily forested countries are an exception).

- **Difficult to balance financial prudence with needs:** For some financial institutions, possibly over-prudent financial discipline limits the potential to increase climate financing. For example, some bilateral DFIs and MDBs have very high ratios of shareholders' equity to debt, or are not permitted at all to borrow from markets to finance either short-term or long-term debt.

Table 1: Summary of international public climate finance actors comparative constraints and strengths

	BILATERAL AID AGENCIES	MULTILATERAL CLIMATE FUNDS	EXPORT CREDIT AGENCIES	BILATERAL DFIs	MULTILATERAL DEV'T BANKS	NATIONAL DEV'T BANKS
Risk Appetite	●	●	◒	◒	○	○
Strong Climate Mandate	◒	●	○	◒	◒	○
Nimble decision making	◒	○	◒	●	◒	●
Financially independent & sustainable	○	○	●	◒	●	◒

Note: Actors presented in order of decreasing risk appetite. Full circle symbolizes high score, half-circle moderate, empty circle low

At the same time, other financial institutions have suffered from lack of discipline, or have a high proportion of borrower membership that pressures credit ratings. For example, some national development banks are often entirely owned by their national government, and domestic policy goals can take priority over financial prudence.

- **Lack of capacity and technical know-how:** Many developing country institutions have not yet adopted harmonized climate accounting, climate finance targets, or mainstreaming, often as a result of lack of capacity and technical know-how. In the MDBs, the sun-setting of the Climate Investment Funds (CIFs) risks loss of know-how in the MDBs, whose climate activities have been significantly supported by the availability of concessional finance.
- **Use of grants not always aligned with risk-taking and innovation:** Although grants are often raised as a solution to lack of risk capital, in practice they are not optimally deployed for taking risk. This is due to pressure for results that can increase the risk aversion of the deploying institutions (OECD 2017, SSIR 2013, Azoulay et al 2010); administrative complexity and transparency requirements can clash with needs of the private sector; and lack of organizational capacity on new processes (OECD 2016b, WEF 2015).

We identify a number of common opportunities for more and better climate finance, many of which are best practices yet to be more widely adopted.

- **Take advantage of innovative, yet prudent, opportunities to access capital markets for additional finance leverage.** Recently, we have seen both IDA and the ADB expand their leverage capacity through prudent measures. Yet in our review of international public actors, we noticed a number of institutions, notably several bilateral DFIs, which had significantly lower leverage than their peers.
- **Mainstream climate finance across operations, including financial sector development activities.** Institutions that have yet to mainstream climate change mitigation and adaptation (through, e.g., scoring of all projects), could develop this type of process. Organizations that have already developed basic mainstreaming could extend this work further: in particular, our systems analysis identified that, while many organizations have adopted mainstreaming at the project level, a significant gap persists in terms of helping to develop "green" domestic financial systems in developing countries in conjunction with broader financial systems development activity.
- **Increase flexibility in product offerings, particular for de-risking instruments.** Some institutions are artificially restricted from offering certain products even if they are most appropriate to advance development and climate aims and are financially prudent. For example, the Overseas Private Investment Corporation (OPIC) in the U.S. is only allowed to offer debt financing despite opportunities in equity and de-risking (CGD 2013, 2015). Other institutions, notably export credit agencies (ECAs), have been very innovative in their offerings in response to market opportunity and are seeing such efforts pay off in terms of increasing business (EXIM 2015).

  Guarantee instruments in particular help to crowd in private finance and can target specific classes of risks (ODI 2014). For example, for ADB, the majority of guarantees are covering loans in local currency, and a large share of guarantees is in infrastructure, particularly the electric power generation sector, corresponding to its large share of loans in the sector. Innovative ways to utilize guarantee instruments more efficiently include reinsuring a portfolio to third party insurers. Although this increases costs, it would release financial resources for more transactions (ODI 2014).
- **Work across government and private sector arms and teams to unlock investment by supporting enabling environment reform.** Many barriers to private investment are the result of poor policy environments. Several recent innovations have focused on coupling enabling environment reform with immediate opportunities to increase private sector investment.[7]

7 For example, IFC's Scaling Solar initiative in Zambia helped the government to develop an auction for renewable energy that de-risked bids by standardizing contracts and PPAs, identifying sites, and managing social and environmental risks in advance of the auction. The auction resulted in the lowest ever African solar power prices (Myers 2016).

4. System approaches for climate finance to lever green financial system development

While there are demands for international public finance institutions to play in scaling up climate finance, the overlaps and tensions identified in the previous chapter serve to restrict potential leverage points.

Systems thinking approaches provide the potential to identify and measure how international public climate finance actors can intervene and interact, given their constraints and direction of travel outlined in the previous section.

The following section proposes a systems framework for international public climate finance providers to 'connect the dots' and optimize coordination and collaboration within developing country financial systems, given emerging trends in green finance adopted by domestic actors, and how new international public finance interventions may take account of them.

CPI's Global Landscape of Climate Finance (GLCF) series captures public and private finance flows as defined by the nature of the actors undertaking the transaction (Buchner et al 2015).

Public finance flows are those carried out by central, state or local governments and their agencies at their own risk and responsibility. These actors include:

- **Governments** through their ministries, departments and aid agencies.
- **Development finance institutions** – either national or multilateral; development bank or export-credit agency.
- **Climate funds** – predominantly multilateral climate funds established under international environmental agreements.

Private finance flows are categorized by:

- **Commercial financial institutions**.
- **Private equity**, venture capital, and infrastructure funds (debt or equity).
- **Institutional investors –** large asset owners across the financial system such as insurance companies, pension funds, foundations and endowments.
- **Project developers –** entities designing, commissioning, operating, and maintaining emission reductions projects (e.g. utilities and energy companies)
- **Corporate actors** such as non-energy sector corporations investing in climate solutions.
- **Households –** family-level economic entities, high net-worth individuals (HNWI), and their intermediaries (e.g. family offices investing on their behalf).

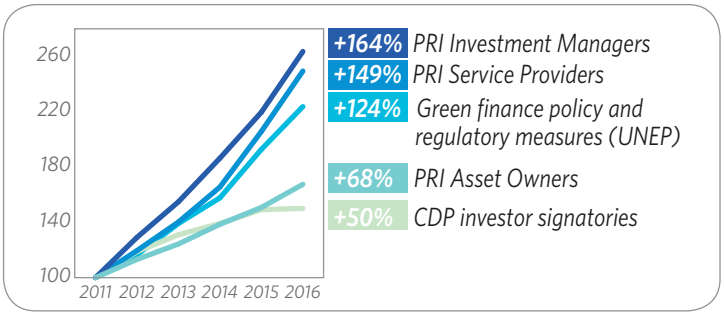
Many of the sources of climate finance flows for public and private finance actors captured in the GLCF are, in itself, an output of financial markets – funds raised by governments, DFIs, banks, corporations through bonds, initial public offerings (IPOs), institutional investments, and banking.

These financial markets, in turn, are affected by

- **Systemic enablers –** actors responsible for the financial system enabling environment – such as central banks, regulatory agencies, exchanges and supervisory organizations.
- **Service providers –** investment advisors, consultants, credit rating agencies, and professional associations.

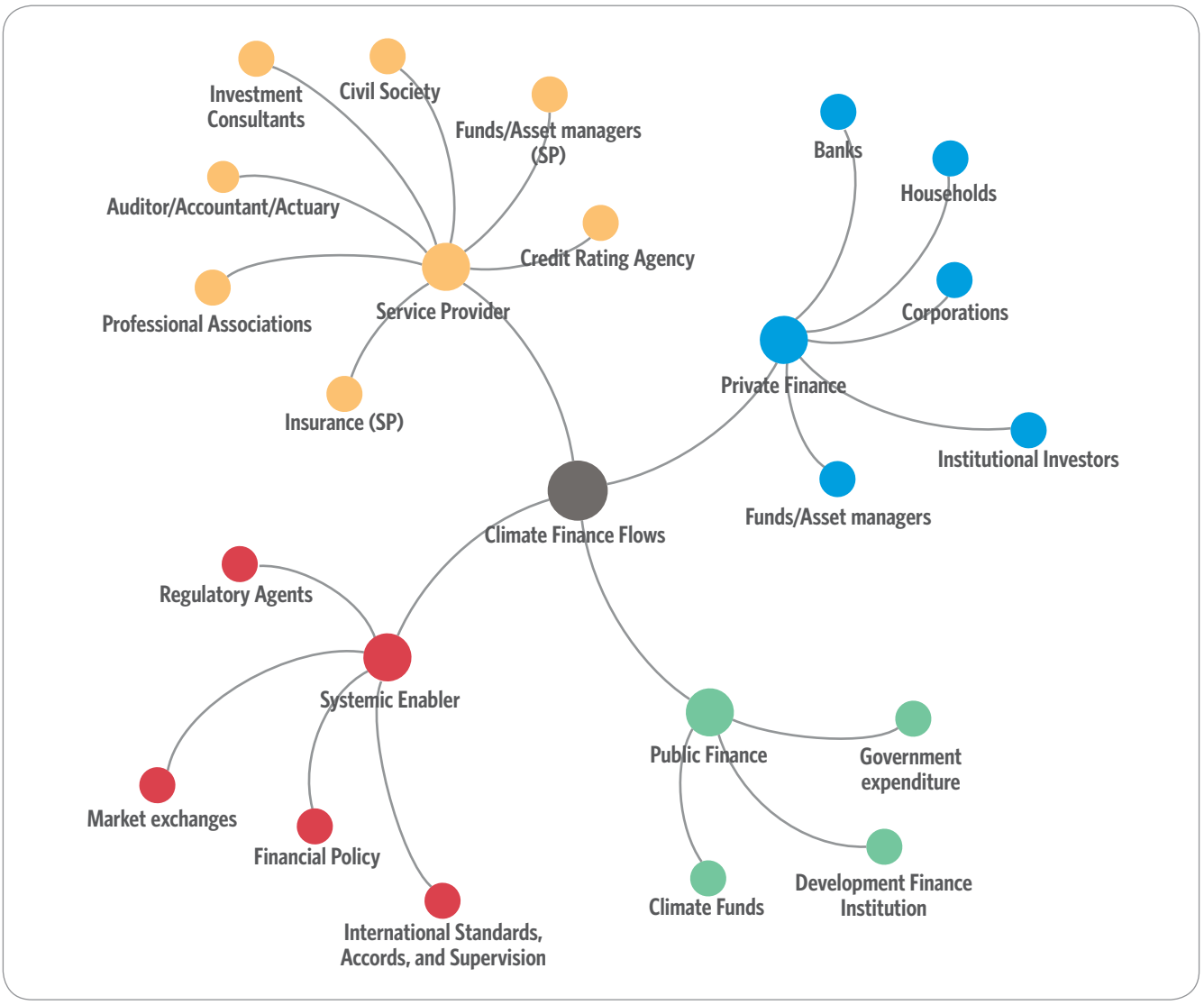
Since 2011, engagement of financial system enablers and services providers on climate change has steadily increased. Between 120-160% growth has been measured in new sustainable financial policy and regulatory measures, and in the number of service providers such as investment consultants and investment managers becoming signatories to the UN PRI (Figure 4).

Figure 6: Growth in engagement of investors, service providers and policy/ regulatory actors (indexed 2011=100)



Developing countries themselves are the location of most proactive and prescriptive actions by systemic actors that support new potential climate finance flows. The work of the UNEP Inquiry into a Sustainable

Figure 7: Actor mapping within the Climate Finance System Framework



Financial System in particular has catalogued these trends, measures, and initiatives by different financial system actors across developed and developing countries. Approximately 50% of green financial policy and regulatory measures are found in developing countries (UNEP Inquiry 2016b).[8]

This underlines the need to understand how these policies and measures may have a direct or indirect effect on quantitative, annual climate finance flows as captured under the GLCF and how international public actors need to take the impact and influence of these actions into account.

Approximately 50% of green financial policy and regulatory measures are found in developing countries.

A Climate Finance Systems Framework, as illustrated in the actor map in Figure 5, extends the public and private finance actors responsible for financial flows captured in the Global Landscape of Climate Finance, to also account for the actions of financial system enablers and service providers – thereby capturing the effect of rules, mandates and information flows – across the system.

8 These include Brazil, China, Indonesia, Mongolia, Bangladesh, Colombia, Kenya, Morocco, Nigeria, Vietnam, Peru, Philippines, Egypt, Mauritius

Based on literature review, we have catalogued the mandates, tools, and effect on climate finance flows of both public and private finance actors traditionally captured in the GLCF as well as systemic enablers and service providers in the financial system (see Working Paper).

Cataloguing the actions by each actor-type across the system reveals 3 types of action:

- Action that follows an actor's current perspective or focus area in the financial system
- Actions that represent a deployment of a new mandate, method or tool
- Actions that represent the use of new financial instruments

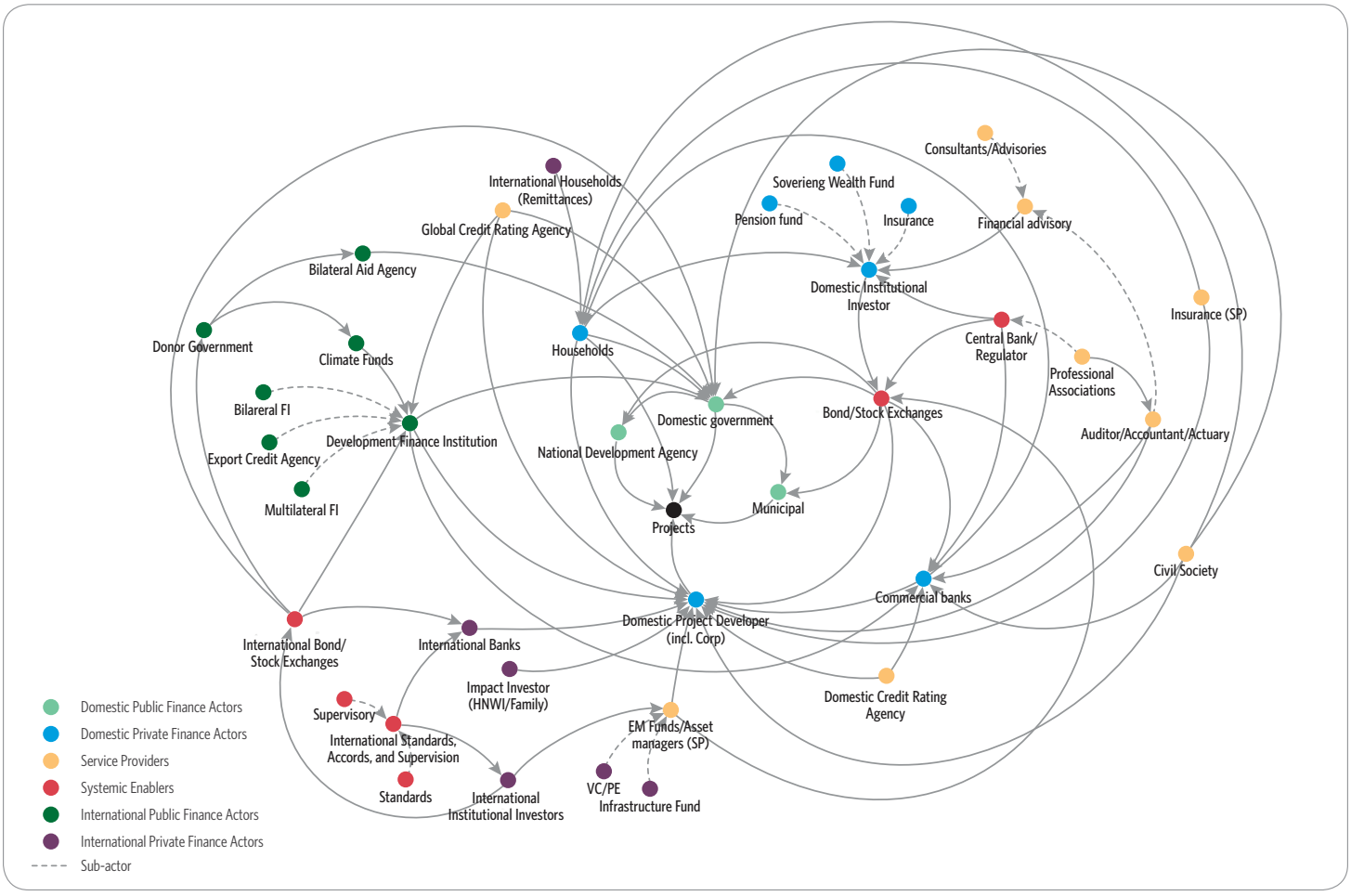
We have developed a contextualized Climate Finance Systems Framework in a domestic setting for a developing country in Figure 6.[9]

The framework provides a basis to analyze new public climate finance interventions, taking into account the direction of travel of other actors across the system. The connections chart inter-relationships between actors based on

- financial flows,
- provision of rules or mandates, and
- information in the form of disclosure or advisory services.

Mapping at country level against the below inter-relationship framework can help situate new systemic actions that affect availability of finance flows.

Figure 8: Climate Finance Systems Actor framework in the domestic country context



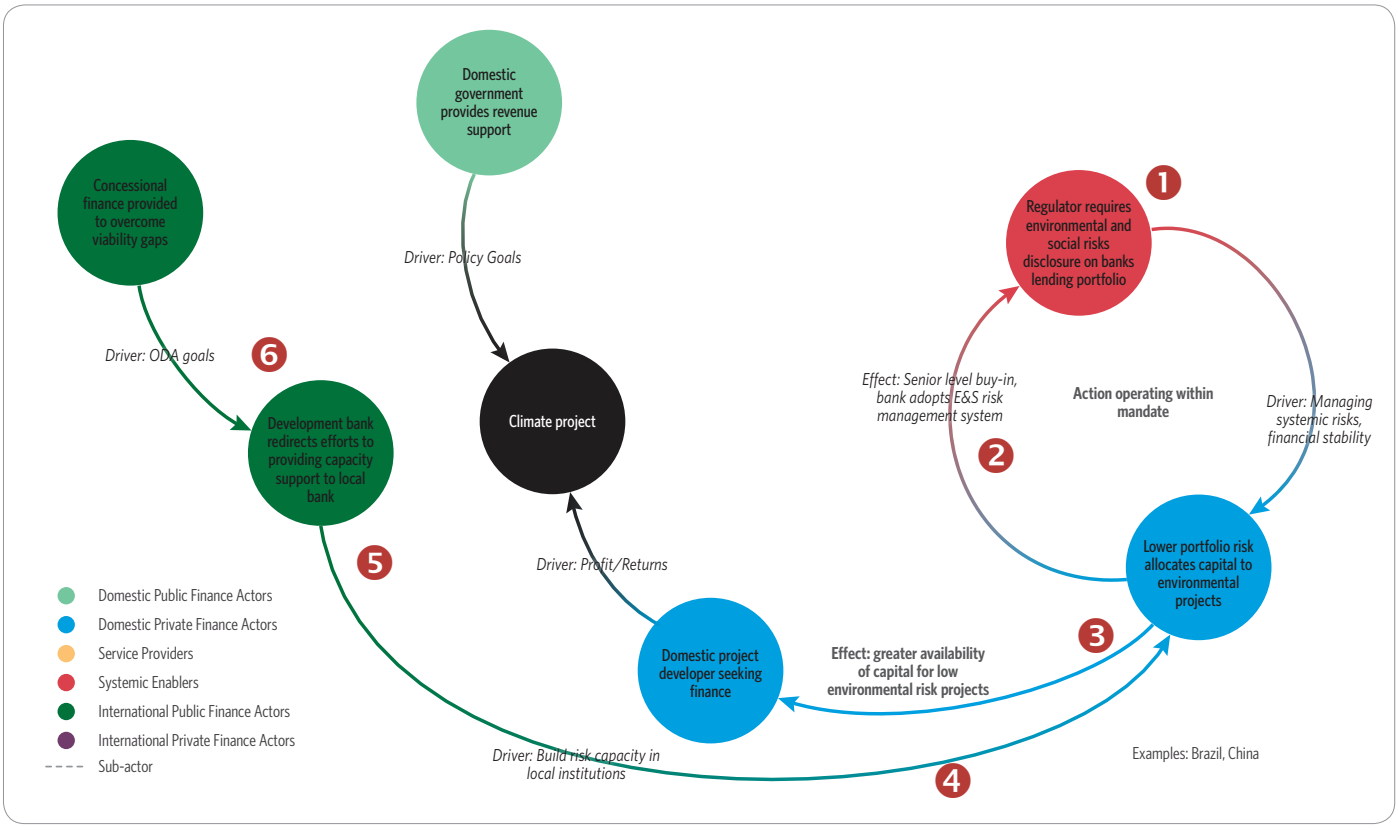
9 As a system goal, the framework sets climate finance into new projects as its main objectives (centre, black dot), emphasizing the placement of public and private, domestic and international finance actors, as providers of direct finance flows, in close proximity. Systemic enablers and service providers are on the outer boundary of the system, however, they can impact key financial actors directly through actions related to rule or mandate setting and providing information flows that can affect particularly private finance actors.

Based on the actor framework and the inter-related connections established between actors, the effect of alternative interventions from other actors in the system may be anticipated, informing better public finance interventions.

Against a baseline intervention of concessional or public finance flows respond to a lack of access to finance or high costs of capital for climate projects by providing direct lending to project developers; the effect of an intervention of a systemic enabler locally may be mapped. (center, black dot). Both the drivers, actions and therefore perspectives of recipient country actors domestically are reflected as well as the drivers, actions and perspectives of international provider perspectives.

This map reflects an action by a systemic actor operating within their mandate. In this case the banking regulator mandates banks to disclose environmental and social (E&S) risks within their lending portfolio. Regulators in both Brazil and China have introduced guidelines to make the assessment of E&S factors routine part of financial risk management (UNEP Inquiry 2016b). **The increased awareness in the local banking sector may reveal the potential availability of private flows and lead to public finance providers prioritizing the reinforcing of capacity over direct loans in the domestic system.**

Figure 9: System dynamic map of condition B actions



DOMESTIC RECIPIENT PERSPECTIVE	INTERNATIONAL PROVIDER PERSPECTIVE
1 Regulators require disclosure on E&S risks on lending portfolios. Drivers: managing system risks, increasing stability	4 Provision of concessional finance to complement available local bank finance.
2 Banks build structures for E&S risk management, adopt standards, disclose and report. Increase awareness. Drivers: Senior level buy-in.	5 Prioritization of capacity support over lending by development finance institution.
3 Bank finance better equipped to manage risk	6 Public finance reallocated to alternative gap.

5. System approaches to assist coordination and collaboration among international public finance actors

Within the international public finance sub-system, system mapping can help identify opportunities for coordination and collaboration among institutions, for example by identifying the main channels and leverage points.

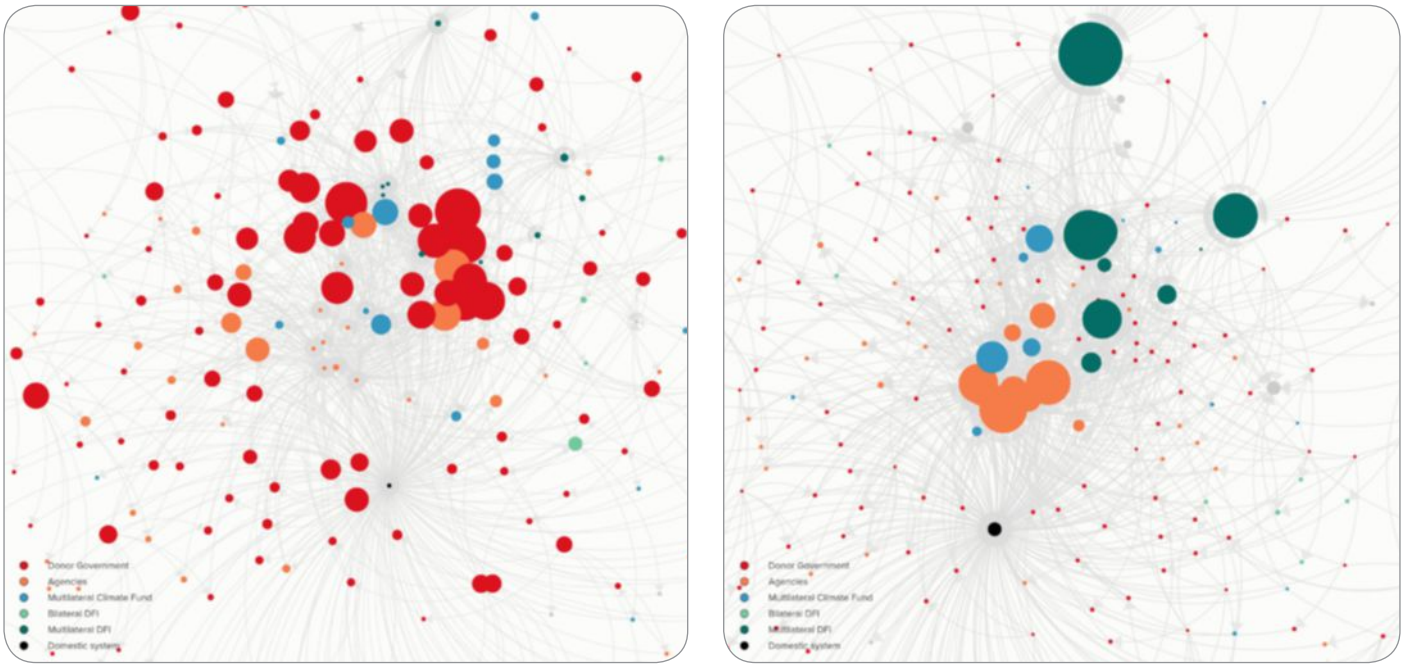
Adopting a social network analysis, the key *influencers* and *connectors* across the international public climate finance system may be measured to help understand leverage points or bottlenecks. Figure 8 illustrates the number of financial flow relationships over 2013 and 2014 based on the Global Landscape of Climate Finance. Some government, bilateral aid sources of climate finance with the most reach across the system may be identified (left hand side graph). Whereas major development banks, climate funds and international agencies may have the most influence as represented by number of incoming connections.

The relative robustness of the system may be measured through its connectivity. For example, most OECD countries possess over 10 outgoing financial flow connections to other actors, but among multilateral climate funds, only one such entity has more than 10 outgoing connections.

In theory, coordination among international public actors is useful to ensure lack of duplication of efforts and to help build scale of efforts. However, because institutions have different procurement processes, reporting requirements, and cultures, in practice coordinating closely at project level can be challenging, and the rationale for it needs to be justified.

Beyond the project level, coordination can also be achieved through country-level strategy development by national governments (such as Nationally Determined Contributions and their supplemental policies) that help international actors define and act upon their comparative advantages in line with the national strategy.

Figure 10: Social Network Analysis of climate finance landscape with actors sized by number of outgoing financial flow connections (left side) and number of incoming financial flows connections (right side)



6. Opportunities for accelerating climate finance in light of needs, comparative strengths, and systemic considerations

Optimizing the use of international sources of public climate finance requires recognition of existing and emerging actors' inherent constraints, the capacity and needs of developing country systems to absorb finance, and a long-term view of how circumstances change in uncertain economic and political environments.

The systems approach frameworks developed in this project offer methods to enhance coordination and collaboration among actors both within the international public climate finance system, and during design of interventions within developing country contexts.

Figure 9 overleaf provides a graphic overview of needs and gaps drivers across developing countries, against the drivers of public finance actor perspectives.

- While specific systems and needs are best evaluated on a country by country basis, short-termism, growing risks and volatility are prevalent across developing country financial systems, impacting currency risk evaluation and potential public support for climate policies.
- Access to finance, the costs of and suitability of current financial products, and lack of tools and methods to enact low carbon and climate resilient projects remain the key barriers to climate finance growth. Political and policy risks in the domestic environment are also cited as a key barrier to address in supporting private finance solutions.
- The most prevalent instruments and solutions identified include blended or structured finance vehicles, utilising concessional finance; de-risking instruments such as guarantees or insurance; the provision of data and tools to manage uncertain risks; and policy support and technical assistance to reduce or manage political risks.

However, while such solutions are commonly called for, delivering them at scale require some of the major public finance actors in climate finance to adapt and change business models.

International Public Actors have been constrained by:

- Perceived trade-offs in meeting multiple mandates on poverty alleviation, development and climate change, creating silo effects within organisations and budget lines.
- Over-prudence in leveraging capital against healthy balance sheets. While recent efforts have leveraged greater amounts of capital, current risk ratios by some actors, particularly some bilateral development banks, are over-prudent.
- Lack of linkages on use of grant capital in combination with domestic policy or enabling environment risk reduction due to lengthy procedures, political pressures or lack of innovation culture in some institutions. This constraint may be reinforced by sources of concessional capital being bottlenecked in key 'connector' institutions such as the GCF.

International Public Actors are best positioned to:

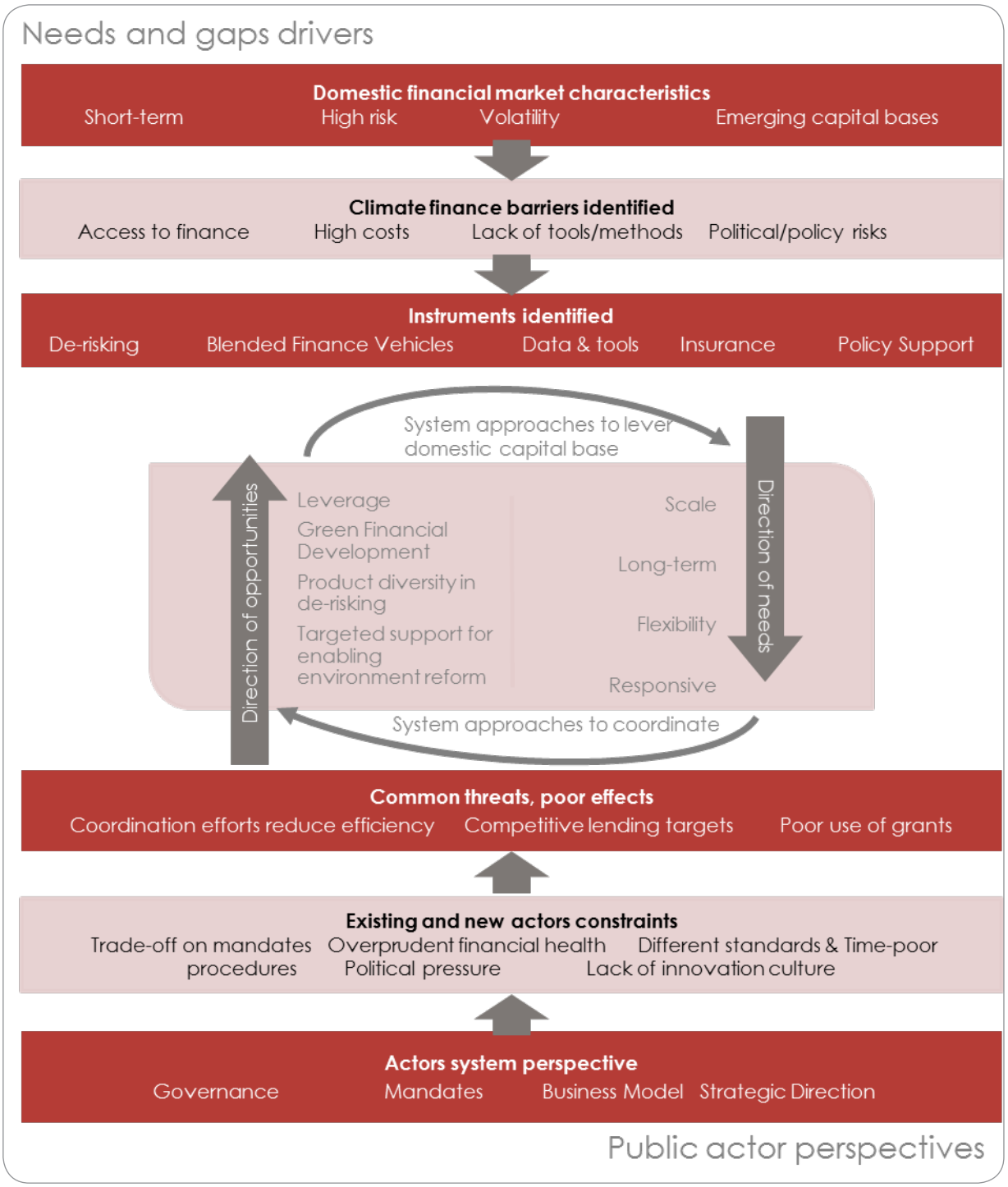
- Scale up blended finance and risk mitigation instrument offerings in line with a more flexible capital raising strategy.
- Harmonize existing procedures and standards, including through coordination with new institutions. AIIB and NDB, as well as sub-regional and smaller national development banks, can learn from MDBs to set targets, harmonize accounting, and mainstream climate into their existing product lines.
- Shift climate finance modes from project finance focus to financial system development focus. So far, there is little effort to support mainstreaming of climate change into financial system development activities; most climate activities have focused on project finance. Our analysis has shown that broader system actors may impact the effectiveness public climate finance flows through:
  - » New regulatory actions for banks and the domestic institutional investments,
  - » Increased information flows through disclosure on ESG risks from service providers, and
  - » New mandates for green debt and equity investments by investors

In light of not only the scale of climate finance needs, but also the type of public finance instruments needed to leverage private flows, the importance of more connected coordination and collaboration by

international public climate finance actors is crucial. Systems thinking approaches support the recognition of the effects of existing and new actors on scaling overall flows and their direction of travel, as well as support the collective optimisation of public finance interventions

actors can most effectively coordinate and collaborate to achieve enduring impact.

Figure 11: Overview of key needs and solutions in coordination and collaborating on climate finance delivery



to achieve the scale needed – helping to understand not only the specific niche of each actor, but also how

7. References

Aronson, D. 1998. Overview of Systems Thinking.

Azoulay P., Ziven, JSG, Manso, G. 2010. Incentives and Creativity: Evidence from the Academic Life Sciences. Available at: http://pazoulay.scripts.mit.edu/docs/hhmi.pdf

Bhattacharya, A. Oppenheim, J. Stern, N. 2015. Driving sustainable development through better infrastructure: Key elements of a transformation program.

Buchner B., Trabacchi, C. Mazza, F., Abramskiehn, D., Wang, D. 2015. Global Landscape of Climate Finance 2015. Available at: https://climatepolicyinitiative.org/wp-content/uploads/2015/11/Global-Landscape-of-Climate-Finance-2015.pdf

Buchner, B., Mazza, F., Falzon, J. 2016. Global Climate Finance: An Updated View on 2013 and 2014 Flows. Available at: https://climatepolicyinitiative.org/publication/global-climate-finance-updated-view-2013-2014-flows/

CDB 2012. Review of Caribbean Development Banks Lending Products – Final Report. Available at: http://www.caribank.org/uploads/2012/05/SDF8_2_NM_11_Review_of_CDB_Lending_Products.pdf

CGD 2013. OPIC Unleashed: Strengthening US Tools to Promote Private-Sector Development Overseas. Available at: https://www.cgdev.org/sites/default/files/OPIC-Unleashed-final.pdf

CGD 2015. Bringing US Development Finance into the 21st Century: Proposal for a Self-Sustaining, Full-Service USDFC. Available at: https://www.cgdev.org/sites/default/files/CGD-Rethinking-US-Development-Policy-Leo-Moss-Development-Finance-Corporation.pdf

Delgado, C., Wolosin, M., Purvis, N. 2013. Restoring and protecting agricultural and forest landscapes and increasing agricultural productivity. New Climate Economy.

Downs, E. 2011. Inside China Inc. China Development Bank's Cross-border Energy Deals. Available at: https://www.brookings.edu/wp-content/uploads/2016/06/0321_china_energy_downs.pdf

EIB. 2016. Banking in Sub-Saharan Africa. European Investment Bank. Luxembourg.

Exim 2015. Report to the U.S. Congress on Global Export Credit Competition. Available at: http://www.exim.gov/sites/default/files/reports/EXIM%202014CompetReport_0611.pdf

Gopal, S. Clarke, T. 2015. System Mapping: A Guide to Developing Actor Maps. FSG

IDA 2017. Towards 2030: Investing in Growth, Resilience and Opportunity. Available at: http://documents.worldbank.org/curated/en/348661486654455091/pdf/112728-correct-file-PUBLIC-Rpt-from-EDs-Additions-to-IDA-Resources-2-9-17-For-Disclosure.pdf

IFC 2016. Climate Investment Opportunities in Emerging Markets. International Finance Corporation. Washington D.C.

IMF 2016a. Global Financial Stability Report 2015/2016. International Monetary Fund. Washington. D.C.

IMF 2016b, World Investment Outlook 2016. International Monetary Fund. Washington. D.C.

IMF 2016c. Capital flows – review of experience with the institutional view. International Monetary Fund. Washington. D.C.

JICA 2017. Investor Presentation. Available at: https://www.jica.go.jp/english/ir/financial/c8h0vm0000aypxks-att/IRpresentation.pdf

McKinsey 2016. Financing Change: How to mobilize private-sector financing for sustainable infrastructure. McKinsey Center for Business and Environment.

MDBs. 2016. 2015 Joint Report on Multilateral Development Banks' Climate Finance.

Myers, G. 2016. Zambia Solar Auction Sees Record Low Bid Of 6.02 ¢/kWh. Available at: https://cleantechnica.com/2016/06/20/zambia-solar-auction-sees-record-low-bid-6-02-¢kwh/

NORAD 2014. Real-Time Evaluation of Norway's International Climate and Forest Initiative. Available at: https://www.oecd.org/derec/norway/Real-Time-Evaluation-of-Norway-International-Climate-and-Forest-Initiative-Synthesising-Report-2007-2013.pdf

ODI 2014. Guarantees for Development. Available at: https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9398.pdf

OECD 2016. In-donor Refugee costs reported as ODA by OECD-DAC members. Available at: http://www.oecd.org/dac/financing-sustainable-development/refugee-costs-oda.htm

OECD 2017. Embracing Innovation in Government – Global Trends. Available at: http://www.oecd.org/gov/innovative-government/embracing-innovation-in-government.pdf

OECD 2016b. OECD Development Cooperation Peer Reviews: United States 2016. Available at: http://www.keepeek.com/Digital-Asset-Management/oecd/development/oecd-development-co-operation-peer-reviews-united-states-2016_9789264266971-en#page60

OECD/UNDP 2016. Making Development Cooperation More Effective. Available at: http://www.keepeek.com/Digital-Asset-Management/oecd/development/making-development-co-operation-more-effective_9789264266261-en#.WIsYFDLMzu0#page3

Schmidt-Traub, G. 2015. Investment Needs to Achieve the Sustainable Development Goals. Sustainable Development Solutions Network. United Nations.

SE4ALL 2016. Scaling up Finance for Sustainable Energy Investments – Report of the SE4ALL Advisory Board's Finance Committee – 2015.

SSIR 2013. Unleashing Breakthrough Innovation in Government. Stanford Social Innovation Review. Available at: https://ssir.org/articles/entry/unleashing_breakthrough_innovation_in_government

Trabacchi, C., Brown, J., Boyd, R., Wang, D., Falzon J. 2016. The role of the Climate Investment Funds in meeting investment needs.

UNCTAD 2014. World Investment Report 2014. United Nations, Switzerland.

UNDP 2012. Towards Sustaining MDG Progress. Available at: http://www.undp.org/content/dam/undp/library/Poverty%20Reduction/Inclusive%20development/Towards%20Human%20Resilience/Towards_SustainingMDGProgress_Ch3.pdf

UNEP 2016. The Adaptation Finance Gap Report 2016. United Nations Environment Programme (UNEP), Nairobi, Kenya

UNEP Inquiry 2016a. Green Finance for Developing Countries. Available at: http://unepinquiry.org/publication/green-finance-for-developing-countries/

UNEP Inquiry 2016b. The Financial System We Need: From Momentum to Transformation. Available at: http://unepinquiry.org/publication/the-financial-system-we-need-from-momentum-to-transformation/

UNEP Inquiry 2016c. The Experience of Governance Innovations in South Africa. Available at: http://unepinquiry.org/publication/south-africa-3/

UNEP Inquiry 2015. Indonesia Country Report. Available at: http://unepinquiry.org/publication/indonesia/

UNFCCC 2016 http://unfccc.int/files/secretariat/regional_collaboration_centres/application/pdf/report_ndc_survey_final.pdf page 12

World Bank. 2015. Global Financial Development Report 2015/2016: Long-Term Finance. Washington, DC: World Bank

World Bank. 2016. World Development Indicators. Available at: http://data.worldbank.org/data-catalog/world-development-indicators

WEF 2015. A How-To Guide for Blended Finance. Available at: http://www3.weforum.org/docs/WEF_Blended_Finance_How_To_Guide.pdf