



MOVING THE FULCRUM: A PRIMER ON PUBLIC CLIMATE FINANCING INSTRUMENTS USED TO LEVERAGE PRIVATE CAPITAL

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Targeting public finance to leverage private sector capital can help meet the several hundred billion dollars of annual low-carbon investment required in developing countries. This working paper serves as a primer, demonstrating how the public sector can employ different types of public financing instruments—whether loans, equity, or de-risking instruments—alongside policy and technical support to scale-up private sector investment in low-carbon markets.

EXECUTIVE SUMMARY

The Problem: Projected climate change mitigation investment needs in developing countries—including for low-carbon sectors—are significant, growing, and may not be met. Experts estimate new investments of up to \$300 billion annually by 2020, growing up to \$500 billion annually by 2030, are required to mitigate developing countries’ greenhouse gas emissions to levels in line with global targets.¹ While industrialized nations have committed to mobilizing new funds of \$100 billion annually by 2020 to meet these needs, this level of funding is far from what is required.

One Solution: Redirect the private sector’s growing investment in developing countries to help fill the growing climate finance gap. McKinsey estimates that the financial stock—that is, the total value of outstanding stocks and bonds—of developing countries grew by \$11 trillion in 2011.² By intervening to improve the investment attractiveness of climate change-relevant markets, the public sector has a significant opportunity to harness and redirect these significant private sector capital flows away from fossil fuel-driven sectors and toward low-carbon development.

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The Challenge: Mobilizing private sector investment will require better targeted public support that improves the risk-reward calculus of low-carbon markets. The private sector seeks markets that exhibit (i) attractive returns relative to associated risks over an appropriate investment timeframe (“attractive risk-reward calculus”) as well as (ii) adequate size, liquidity, and transparency. These conditions are often absent in developing countries due to the nascent natures of both low-carbon and financial markets in these geographies.

Recommendation: To improve the risk-reward calculus of investments—arguably the most fundamental barrier to leveraging private capital—the public sector can complement support for low-carbon policies with direct finance that manages the following risks:

- *Political and macroeconomic risks.* Political risk guarantees, interest-rate/currency exchange products, and local currency loans can help investors and project developers financially manage political (for example, political instability) and/or macroeconomic (for example, exchange rate volatility) risks. As these financing instruments are not easily accessible in poorer countries, by providing these instruments, the public sector can catalyze low-carbon investment in geographies where access to finance is most challenging.
- *Low-carbon market risks, including policy, technology, and operational risks.* These risks, which range from unexpected policy changes to technology failures, can affect both new and mature low-carbon markets. In newer low-carbon markets, public financing instruments like first-loss equity and debt investments and concessional loans can be instrumental in encouraging early investment. Projects in more established low-carbon markets—like solar, wind, and energy efficiency—can benefit from flexible loans, partial risk and credit guarantees, and risk sharing facilities.

Given the varied investment conditions across developing countries and their respective low-carbon markets, each market will require a unique combination of finance and policy support to scale-up private sector investment. Future WRI publications, drawing on private sector perspectives, will delve deeper into how public climate finance providers—whether governments, development finance institutions, or export-credit/aid agencies—can tailor direct finance to scale-up private sector investment in different markets.

INTRODUCTION

Developing Countries’ Climate Change Investment Needs

Experts estimate developing countries will require new investments of up to \$300 billion annually by 2020—growing up to \$500 billion annually by 2030—to limit their growing greenhouse gas emissions in line with a global stabilization target of 450 parts per million of CO₂ equivalent (Table 1).

Table 1 | **Projected Annual Climate Change Mitigation Financing Needs in Developing Countries**

DATA SOURCE	AVERAGE ANNUAL PROJECTED FINANCING NEED: 2010-2020	ANNUAL PROJECTED FINANCING NEED: 2030
International Institute for Applied Systems Analysis (2009)	\$63-165 billion	\$264 billion
International Energy Agency (2008)*	\$565 billion	\$565 billion
McKinsey & Company (2009)	\$300 billion	\$563 billion
Potsdam Institute for Climate Impact Research (2009)	N/A	\$384 billion

Source: Adapted from World Development Report 2010; Table 6.2 of Chapter 6: “Generating the Funding Needed for Mitigation and Adaptation.”

Notes: *IEA figures are annual averages through 2050 and are focused on energy-related needs. All estimates are in 2005 dollars.

- These estimates represent “financing needs” rather than “mitigation costs” of abatement. That is, these estimates represent the necessary upfront capital costs of projects and do not incorporate operational expenditures and savings over the lifetime of the project.
- Estimates consider global stabilization of greenhouse gases at 450 ppm CO₂e, which would provide a 22-74% chance of staying below 2°C warming by 2100, according to the Intergovernmental Panel on Climate Change (2007).

These investment needs are undoubtedly significant, begging the question, where will this investment come from? Recent international negotiations and resulting agreements through the United Nations Framework Convention on Climate Change (UNFCCC) have tried to tackle this complex and challenging question. At the 2009 Copenhagen UNFCCC conference, a subset of industrialized or “Annex II”³ countries first pledged to mobilize “new and additional”⁴ funds of \$100 billion annually by 2020 to help developing countries both mitigate greenhouse gas emissions and adapt (Box 1) to the various impacts of climate change. In subsequent meetings in Cancun (2010) and Durban (2011), Annex II countries reaffirmed their commitment and also recommended an international “Green Climate Fund” (GCF) be set up to channel a portion of these funds.

Although this \$100 billion pledge represents the most significant public commitment to finance climate change needs in developing countries to date, it is also far from what is required for two reasons. First, industrialized Annex II countries may find it challenging to mobilize this level of finance given the recent global financial crisis and resulting budgetary constraints.⁵ Second, even assuming Annex II countries mobilize this \$100 billion, experts estimate that several hundred billion dollars more may still be required for climate change mitigation alone in developing countries as shown in Table 1.

Box 1 | Meeting Adaptation Investment Needs

Developing countries, particularly small and vulnerable island nations, will also need significant investment in coming years to protect themselves from the worsening physical and economic impacts of greenhouse gases already in the atmosphere. Since adaptation projects typically provide public goods (for example, walls to protect coastal areas from sea level rise or disaster relief services) and do not directly generate revenue, it has, to date, been challenging to attract private sector investment into these projects.

There are important exceptions to this generalization. For example, corporations and private sector projects will increasingly need to protect, and insure, their assets and operations from climate change impacts like extreme weather events. But generally, by focusing efforts to leverage private sector investment on climate change mitigation, the public sector can ultimately free-up additional public funds to tackle critical adaptation needs as well.

Source: WRI.

Leveraging Private Capital to Meet Finance Needs

To fill the growing gap between finance needs and funding sources, governments will have to find creative and efficient ways to make their public dollars go further. This primer and subsequent WRI publications will explore one avenue to increasing financial flows to developing countries: using public funds to leverage private sector investment in low-carbon projects (see Box 2 for definitions of key terms used in this primer).

Private sector investors—whether individual investors; private equity (including venture capitalists); or larger institutional investors like pension funds, insurance companies, or sovereign wealth funds—have assets under management representing several trillions of dollars globally. In addition, global, regional, and local financial institutions have the capacity to provide much needed capital and financial services to finance privately-developed climate change projects—if the terms are right. Fostering private participation—whether by private sector capital providers; project developers; or market facilitators—in climate change-friendly markets can not only address near-term development needs, but can also ensure the longer-term viability of these markets as attractive investment opportunities.

In recent years, many public sector actors—including governments; development banks; bilateral aid agencies; public-private partnership funds; and international mechanisms like the Green Climate Fund (GCF)—have started to consider how to use public climate finance to leverage private capital. The UN Secretary General’s High-Level Advisory Group on Climate Change Finance, in its examination of potential sources of climate change finance, concluded that “careful and wise use of public funds in combination with private funds can generate truly transformational outcomes.”⁶ At the most recent UNFCCC meetings in Durban, parties agreed to carve out a dedicated private sector facility to finance and support private sector projects as part of the Green Climate Fund. Since 2010, the United Kingdom’s Capital Markets Climate Initiative (“CMCI”) has been convening policymakers and financiers to inform how the UK attracts private sector climate change investment to emerging markets.⁷ At the same time, the number of climate change-focused public-private partnership funds and initiatives is rapidly increasing in efforts to scale-up private capital flows alongside public flows.

Box 2 | Key Terms used in this Primer

Several terms used in this primer are either recently established or do not have widely-accepted definitions. For reading ease, key terms are defined below solely for the purposes of this paper.

- **Developing countries:** Non-Annex I countries as defined by the United Nations Framework Convention on Climate Change (UNFCCC). Broadly, this definition excludes members of the Organisation for Economic Co-operation and Development (OECD) countries (Annex II) and economies in transition.
- **Developed countries:** Annex II, or OECD member countries, required under the UNFCCC to provide financial resources to assist developing countries mitigate and adapt to climate change.
- **Transition economies or countries:** A subset of Annex I countries which are considered to be transitional economies and thus not required to provide financial assistance to non-Annex I countries; examples of transition countries include Turkey, Malta, and Russia.
- **Emerging markets:** A subset of developing countries that have exhibited rapid growth in recent years; examples commonly cited include Brazil, India, China, and South Africa. Russia is often categorized as an emerging market, but is considered as a transition economy by the UNFCCC and in this paper.
- **Least developed countries (LDCs):** A subset of developing countries—a large majority of which are African nations—which exhibit, as defined by the United Nations, the lowest relative levels of socio-economic development among developing countries.
- **“Climate change-relevant projects”:** Projects in renewable energy, energy efficiency, low-carbon services, sustainable agriculture, sustainable transportation, sustainable water infrastructure and treatment, adaptation activities, and other sectors that promote greenhouse gas emissions reductions or assist in adaptation to climate change impacts.
- **Low-carbon projects:** A subset of climate change-relevant projects, defined narrowly in this primer as those within the renewable energy, energy efficiency, low-carbon services, and related infrastructure sectors.
- **Private sector:** Sector of the economy that is not controlled by the state and comprises of a wide range of actors including individuals, corporations, and private associations (like philanthropies). This primer focuses on three types of private sector actors: capital providers, project developers, and market facilitators.
- **“Private sector capital” or “private capital”:** capital provided by the private sector (versus the public sector).
- **Private sector participation:** involvement of the private sector by investing in, executing, or maintaining a project.
- **Public finance:** using public dollars (raised through taxes and other government revenue streams) to fund the production and distribution of public goods.
- **Public climate finance (“climate-relevant finance”):** public finance from developed countries used to support climate change-relevant projects in developing countries, including low-carbon projects. This paper discusses the use of public climate finance to leverage private sector investment.

Source: WRI.

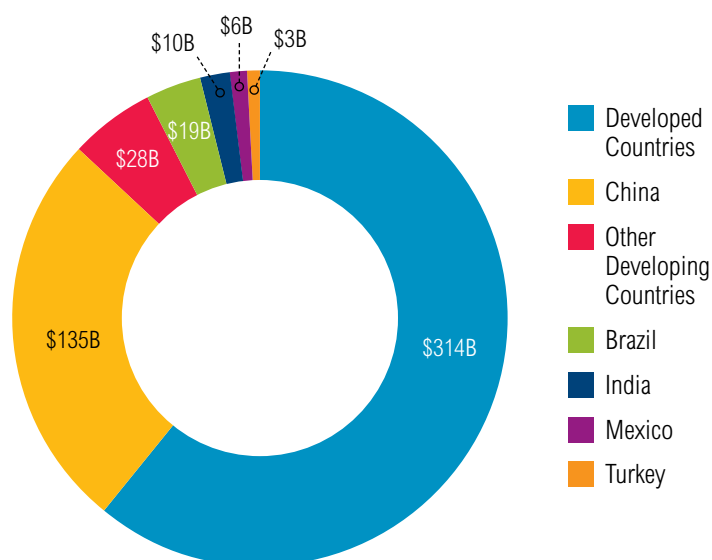
Taking Action to Leverage Private Capital

Despite growing interest in using public funds to leverage private capital, there remains uncertainty about how exactly to do so. Many questions remain, including:

- What types of public support best address private sector needs?
- What institutional processes and procedures must the public sector institute to ensure that private capital is leveraged at the lowest cost to the public (see Box 3), while generating the greatest environmental benefits?
- How can governments and public-private initiatives work together to leverage private capital in markets where access to finance is most challenging (for example, least developed countries and “small and medium enterprise (SME)” markets)?
- How should the roles of different types of public financing institutions and governments in leveraging private capital be delineated?
- How successfully have existing sources of finance from development banks, international mechanisms, and public-private funds, leveraged private capital?
- What lessons can be learned from past successes and failures, whether in climate finance or in other development arenas?

This and subsequent papers will draw from private sector perspectives to address these questions and understand how the public sector can most effectively intervene to promote low-carbon markets, including for renewable energy, energy efficiency, and related infrastructure/services. WRI acknowledges the integral role of domestic climate change and low-carbon policies as well as robust financial regulatory frameworks in creating attracting private sector investment. But this paper focuses on the use of public financing instruments for direct project financing, in order to uncover how the public sector can effectively leverage private capital under varied investment conditions. Lessons are intended to inform all public sector provisioning of international climate finance, whether channeled to developing countries by development banks, bilateral aid agencies, public-private partnership funds, or international mechanisms.

Figure 1 | **Global Low-Carbon Investment (2010, USD billion per annum)**



Source: Modified from the International Finance Corporation's "Climate Finance: Engaging the Private Sector," which used data from Pew Charitable Trust, HSBC, and IFC team analysis.

This primer provides important context for subsequent papers by outlining how the public sector can foster attractive investment conditions (Section I) by addressing investment risks in developing countries' low-carbon markets (Section II) through the targeted use of public financing instruments (Section III).

While this paper looks at the challenges to scaling low-carbon investment, significant opportunities do currently exist for the private sector in developing countries. Figure 1 shows 2010 global, low-carbon investment flows, including in clean energy, energy efficiency, other low-carbon technologies and services, and low-carbon transportation. Global “clean energy” investments—defined in this data source as investment in renewable energy but excluding investment in energy efficiency, large hydropower and supply chain finance—in particular have quintupled in the last decade.⁸ Brazil, China, and India ranked among the

Box 3 | **Measuring Public Sector Success in Leveraging Private Capital**

Many public institutions report the ratio of every private dollar invested, or lent, alongside its own climate change grants, lending, equity investments, and technical assistance. Although this “leverage” ratio can be helpful to track the flow of private capital to specific projects, it is inadequate—and sometimes even misleading—for measuring the success of public climate finance in leveraging private capital. For example, a high leverage ratio may simply indicate that the public sector is taking a high level of investment risk, rather than showing that public funds are being used most efficiently to achieve climate change objectives. Additionally, traditional leverage ratios do not capture important public sector activities like policy development and technical support, which are critical to fostering attractive investment conditions but not easily measured. Beyond these theoretical shortcomings, public actors use different methodologies to calculate leverage ratios, making it hard to identify best practices in mobilizing the private sector.

Developing more accurate calculation methods and ensuring consistent reporting will be challenging tasks, but will ultimately ensure the public sector’s long-term success in leveraging private capital to achieve environmental objectives at the lowest cost to taxpayers.

For more information on public reporting of public-private leverage ratios, refer to the joint Overseas Development Institute, Climate Policy Institute, and Environmental Defense Fund publication “Climate Finance: A Survey of Leveraging Methodologies”, available at <http://www.edf.org/sites/default/files/effectiveness-%20climate-finance-leveraging-methodologies.pdf>.

Source: WRI.

top 10 countries globally attracting clean energy investment in recent years.⁹ In 2010, annual private investment in China’s clean energy sectors increased by 39% to \$54 billion.¹⁰ Similarly, India’s wind capacity has grown rapidly in recent years—the country now ranks fifth globally in wind capacity¹¹—and Brazil now produces most of the world’s sugar-derived ethanol.¹²

Investment beyond Brazil, India, China, Mexico, and Turkey—while representing a smaller share of total investment—have also demonstrated growth potential in their respective clean energy sectors. For example, in 2008 and 2010, Kenya launched, and then revised, feed-in tariff¹³ policies which are expected to result in 1,300 megawatts of new renewable electricity generation capacity over the next five years.¹⁴ Overall, the Middle East and Africa witnessed a collective 104% jump in renewable energy investments in 2010 over the previous year.¹⁵ As developing countries now comprise half of all countries with domestic policies that support renewable energy promotion, clean energy investment opportunities in these countries are likely to grow in the future.¹⁶

SECTION I: CREATING ATTRACTIVE INVESTMENT CONDITIONS

The intended recipients of international climate finance range from rapidly growing economies like Brazil, India, and China, to some of the world’s poorest economies like Rwanda, Bangladesh, and Haiti. Clearly, there is a wide variation between developing countries’ political, regulatory, and low-carbon investment conditions, and therefore, the ease of mobilizing private capital flows. Effectively leveraging private sector flows across these geographies will thus require donor governments (that is, industrialized Annex II countries) to thoughtfully align their support with on-the-ground needs in developing countries, including the requirements of national governments, civil society, communities, and the private sector.

As a first step, increasing low-carbon private sector investment in developing countries will require creating markets with attractive investment conditions.

Defining Attractive Investment Conditions

Three types of private sector actors are most relevant to public actors who are attempting to create attractive investment conditions: Capital Providers, Market Facilitators, and Project Developers.

- **CAPITAL PROVIDERS (“INVESTORS”)**: Private sector actors who make direct investments—whether in the form of debt or equity—in projects. These actors include institutional investors (including sovereign wealth funds, endowments, pension funds, mutual funds, insurance companies, hedge funds, and private equity firms), commercial banks, and corporations making internal capital allocation decisions. Some capital providers may also act as project developers or market facilitators. For example, a bank making direct equity investment into companies using its own capital may also provide underwriting services to assist other companies in raising capital from other sources.
- **MARKET FACILITATORS**: Private sector actors who provide critical financial services. Examples include insurance companies (who offer products that can reduce project and market risks), financial institutions (who provide underwriting, advisory, and other financial services), liquidity providers (who provide short-term loans and/or currency exchange services), rating agencies (who evaluate a project’s ability to repay its debt), and data providers (providing market information). “Market Facilitators” are critical to market creation and growth.
- **PROJECT DEVELOPERS**: Entities (ranging from small and medium enterprises to larger corporations) undertaking projects and seeking financing. Project developers often act as “Capital Providers” since they typically provide a portion of a project’s financing through their own capital contribution (also known as an “equity stake”). In the case of low-carbon development, projects can range from wind and solar installations, to energy efficiency retrofits, to biomass and waste-to-energy conversion facilities.

Ultimately, private capital will flow to markets that provide attractive returns relative to perceived risks over an investor’s chosen timeframe. In the low-carbon markets of developing countries, scaling up private investment is challenging because these newer markets lack the liquidity, scale, and transparency of larger, more mature markets. These three factors are defined as follows:

- **“MARKET LIQUIDITY”** describes an investor’s ability to buy and sell an asset within a market; the more liquid a market, the easier it is for an investor to sell an asset to others in the market, creating more flexibility and improving their chances of recovering their initial investment.
- **“MARKET SCALE”** is the size of a market; the larger a market the more liquidity it has and the more opportunities for diversification, which reduces risk. Larger markets and larger projects are typically associated with lower financing transaction costs relative to total investment.
- **“MARKET TRANSPARENCY”** describes the availability of data and information pertaining to a market; the greater the market transparency, the greater the comfort investors will have in participating in the market as they can reduce uncertainty and make informed decisions about investing and selling market assets.

Effective public actions should ideally address these market needs by considering the following:

- The varying risk-return-timeframe preferences of different types of capital providers. For example, insurance companies tend to prefer investments with consistent and long-term returns, while venture capitalists are less sensitive to volatility and more concerned about the future growth of their investment.
- Opportunities to recycle and leverage funds among capital providers—that is, different parts of the capital chain leveraging each other’s investment. For example, pension funds often invest in other capital providers like private equity funds and hedge funds, who then use this capital to leverage additional investment.
- Varying demand from project developers for different types of capital (for example, equity versus debt) at different stages of development, for different types of projects, in different sectors.
- The importance of market facilitators in scaling up low-carbon markets by increasing market size, liquidity, and transparency. For example, rating agencies, by evaluating the risks of corporate bonds and project loans, help capital providers make informed investment decisions.

Figure 2 | **Public Tools Available to Create Attractive Low-Carbon Investment Conditions**



Source: WRI.

Using Public Finance to Create Attractive Market Conditions

The public sector has a wide range of tools at its disposal to improve the risk-reward calculus of low-carbon investments, and support the size, liquidity, and transparency of low-carbon markets. These tools include (1) public support mechanisms and (2) public financing instruments (Figure 2). This primer focuses on the latter—public financing instruments—but acknowledges that public support mechanisms are critical to creating and growing low-carbon markets.

Public Support Mechanisms

- i. **POLICY AND OVERARCHING SUPPORT:** Supporting low-carbon policies helps improve the risk-reward calculus of low-carbon markets relative to traditional markets. Specific public actions may include assisting—either through monetary support or technical assistance—developing nations institute feed-in tariffs, tax credit programs, quotas for renewable energy investment, renewable energy standards or repealing support for fossil fuel-based sectors.
- ii. **PROJECT-LEVEL ASSISTANCE:** Directly assisting low-carbon projects through grants and subsidies, or helping to aggregate, source, and evaluate projects.

Public Financing Instruments

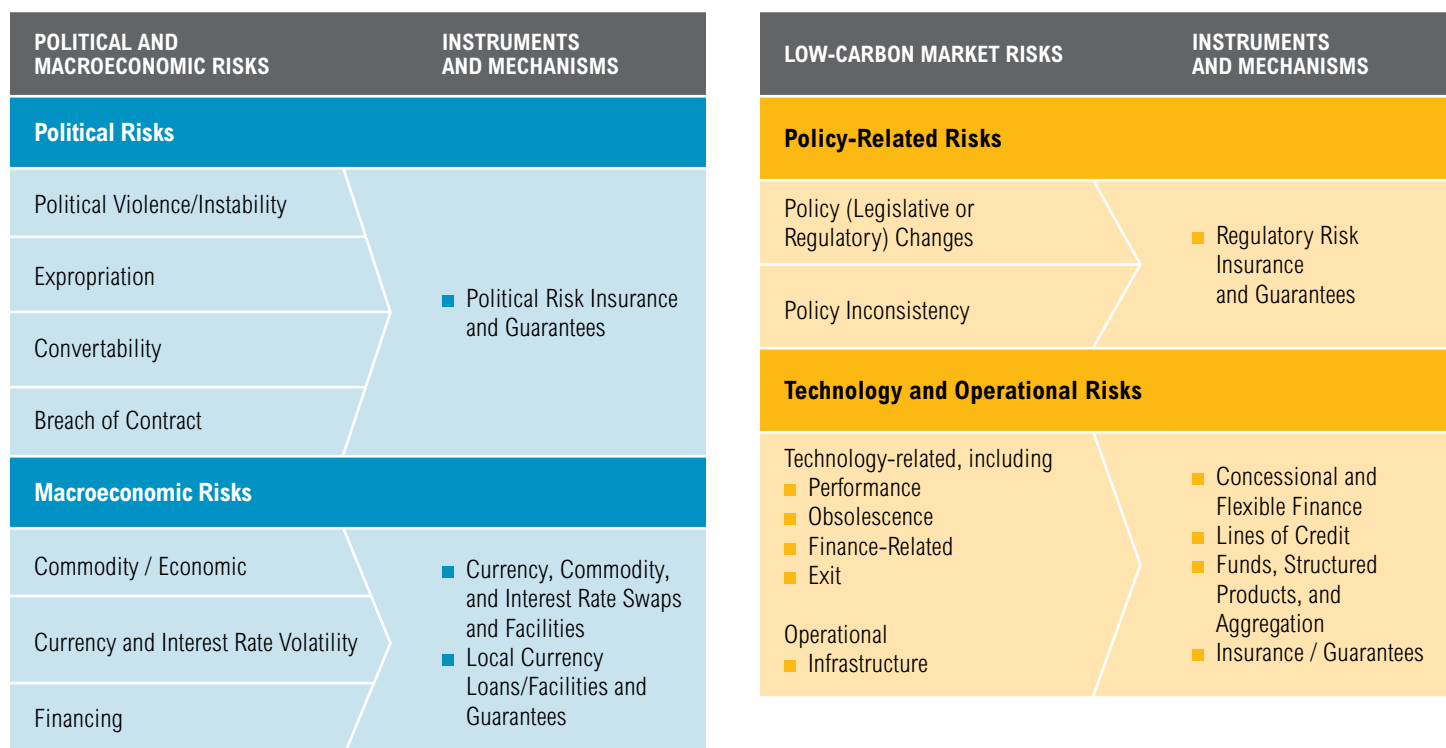
- iii. **LENDING (DEBT):** Providing loan capital—for example, lending to projects, investing in debt funds, purchasing bonds, or offering concessional/flexible loan terms—gives a low-carbon company/project access to finance without relinquishing ownership and can help attract additional finance (including both debt and equity) from the private sector.
- iv. **EQUITY INVESTMENT:** Making a direct capital investment in projects or in funds that invest in projects. Equity provides initial finance for a project/company to grow its operations and access other sources of finance. It also reduces investment risks faced by debt investors.
- v. **DE-RISKING INSTRUMENTS:** Instruments that help investors reduce perceived investment risks, and thus improve the risk-reward calculus of low-carbon investments. Examples of de-risking instruments include loan guarantees, insurance, foreign exchange/liquidity facilities. The public sector may provide these instruments to the private sector project developers or to capital providers at no cost, or at a subsidized rate.

Ultimately, public success in leveraging private capital will rely on using the right mix of public support and finance for the appropriate geography, sector, and project. For example, in emerging markets and transition economies with more established financial markets, direct finance (debt or equity) may be best positioned to attract private sector investors. In less mature economies, resources may be better spent providing policy and overarching support to create an attractive investment environment.¹⁸ The relative balance and type of support provided will thus be context-specific and require coordination between donors, recipient country stakeholders, and the private sector.

SECTION II: USING PUBLIC FINANCING INSTRUMENTS TO REDUCE INVESTMENT RISKS

This section delves deeper into the question of how the public sector can improve the risk-reward calculus of low-carbon investments—a fundamental barrier to private capital flows, and a precursor to increasing market scale, liquidity, and transparency. It outlines key risks faced by the private sector in developing country low-carbon markets, and how public financing instruments can help manage these risks. This section does not discuss public support mechanisms, but acknowledges that in countries without supportive domestic policies and regulations, public funds may be better spent on policy and other overarching support like R&D grants and/or technical assistance.

Figure 3 | Summary of Investment Risks and Mitigating Public Interventions



Source: WRI, with information from UNEP report “Catalysing Low-Carbon Growth in Developing Economies” (2009); Standard & Poor’s report “Can Capital Markets Bridge the Climate Change Financing Gap” (2011); ODI Background note “Leveraging Private Investment: the Role of Public Sector Climate Finance” (2011); McKinsey Sustainability & Resource Productivity “Energy Efficiency: A Compelling Global Resource” (2010).

While extensive literature identifying the range of risks faced by the private sector in these markets already exists (see Appendix 2), this primer further categorizes these risks and introduces which public financing instrument(s) are best suited to address each risk category as shown in Figure 3. Each public financing instrument is further explained in Section III and Appendix 1.

Two categories of risk are particularly relevant¹⁹ to low-carbon investment in developing countries: (1) “Political and Macroeconomic” risks, which vary by geography; and, (2) “Low-Carbon Market” risks which vary both by geography and sector, as detailed below.

Political and Macroeconomic Risks

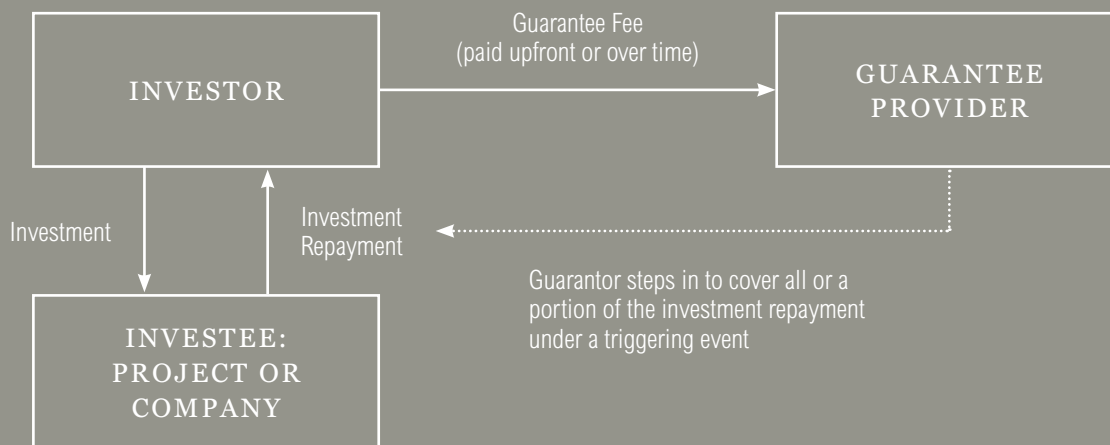
At the broadest level, political and macroeconomic risks affect the risk-return calculus of all projects, including low-carbon projects. These risks, which are driven by political and economic instability, remain common in developing countries. A politically related act of violence or a coup can shut down an otherwise successful project. A currency’s devaluation or inconvertibility can create unexpectedly large losses for a foreign investor, regardless of an underlying project’s performance. Currency exchange risk is of particular concern for infrastructure projects in developing countries since project revenues are typically in local currency while

Box 4 | Mechanics of a Political Risk Guarantee

A political risk guarantee protects an “Investor” from unexpected political risks, which result in an “Investee” defaulting on their investment repayment. In return, the “Investor” pays the “Guarantee Provider” an upfront or ongoing fee. The “Guarantee Provider” essentially acts as an insurer, stepping in to cover all or a portion of the investment repayment if, and when, triggered by one or more stipulated political events. The diagram below provides an indicative example of the

exchange between the “Investor,” “Investee,” and “Guarantee Provider.” This model can apply to other types of guarantees and insurance products, but the triggering events, fees/premiums, payers and payees, underlying investment (for example, debt versus equity) and other transaction terms may vary.

Source: WRI.



project financing is typically in a “hard” currency (that is, more established currencies like the US dollar, Euro, or Yen) due to the large size and long duration of financing needed and the lack of established domestic financial markets from which to access this financing.²⁰ For example, when Argentina de-pegged its currency from the US dollar in 2002 and the peso lost 70 percent of its value, several energy and water utilities had to suspend their investment programs, and ultimately lost revenues and defaulted on debt.²¹

Investors can manage political and macroeconomic risks in some countries through the purchase of “de jure” or explicit political risk insurance/guarantees and currency/interest rate products (see Box 4 and Appendix 1).

Political risk insurance and guarantees are offered to capital providers, select market facilitators, or project developers, either through insurers like Lloyds or Munich Re or through public institutions like the World Bank Group’s Multi-Lateral Investment Guarantee Agency (MIGA). These guarantees typically cover losses from: (1) political violence/civil war; (2) expropriation risk; (3) currency convertibility risk; and (4) government breach of contract (see Box 4 and Appendix 1). The decision of a project developer to purchase political risk insurance is often motivated by capital providers who require insurance coverage to comply with internal risk management guidelines. Private sector insurers typically offer less loss coverage and operate in fewer countries. The limited availability and high cost of these products, particularly in less developed countries where political and macroeconomic risks are great, remain important barriers to private investment in these geographies.

Macroeconomic risks are commonly addressed in emerging and transition markets through financial derivative products—typically provided by private sector financial institutions—which complement existing financing to protect against interest rate, exchange rate, or commodity price volatility. Public institutions may also guarantee or provide dedicated foreign exchange funds or liquidity facilities, exchange rate-related guarantees, or directly offer loans in local currencies to prevent the currency mismatch between project revenues and debt service payments. Partial risk guarantees, which are often used to attract finance to public-private infrastructure projects (see Appendix 1 for a detailed definition), have also been successfully used for power and water projects in developing countries to lengthen the term of loans by addressing investor concerns about longer term macroeconomic risks.²²

Finally, the mere involvement of a multilateral development bank can also help alleviate political risks faced by private sector investors. Multilateral development banks (MDBs) provide de facto (implied) political risk since sovereign governments often give repayment preference to MDBs due to these institutions’ importance as sovereign lenders. This de facto preferred creditor status is a matter of conduct rather than a matter of law (de jure).²³

Figure 4 summarizes different types of political and macroeconomic risks, and matches these risks with mitigating public financing instruments.

Low-Carbon Market Risks

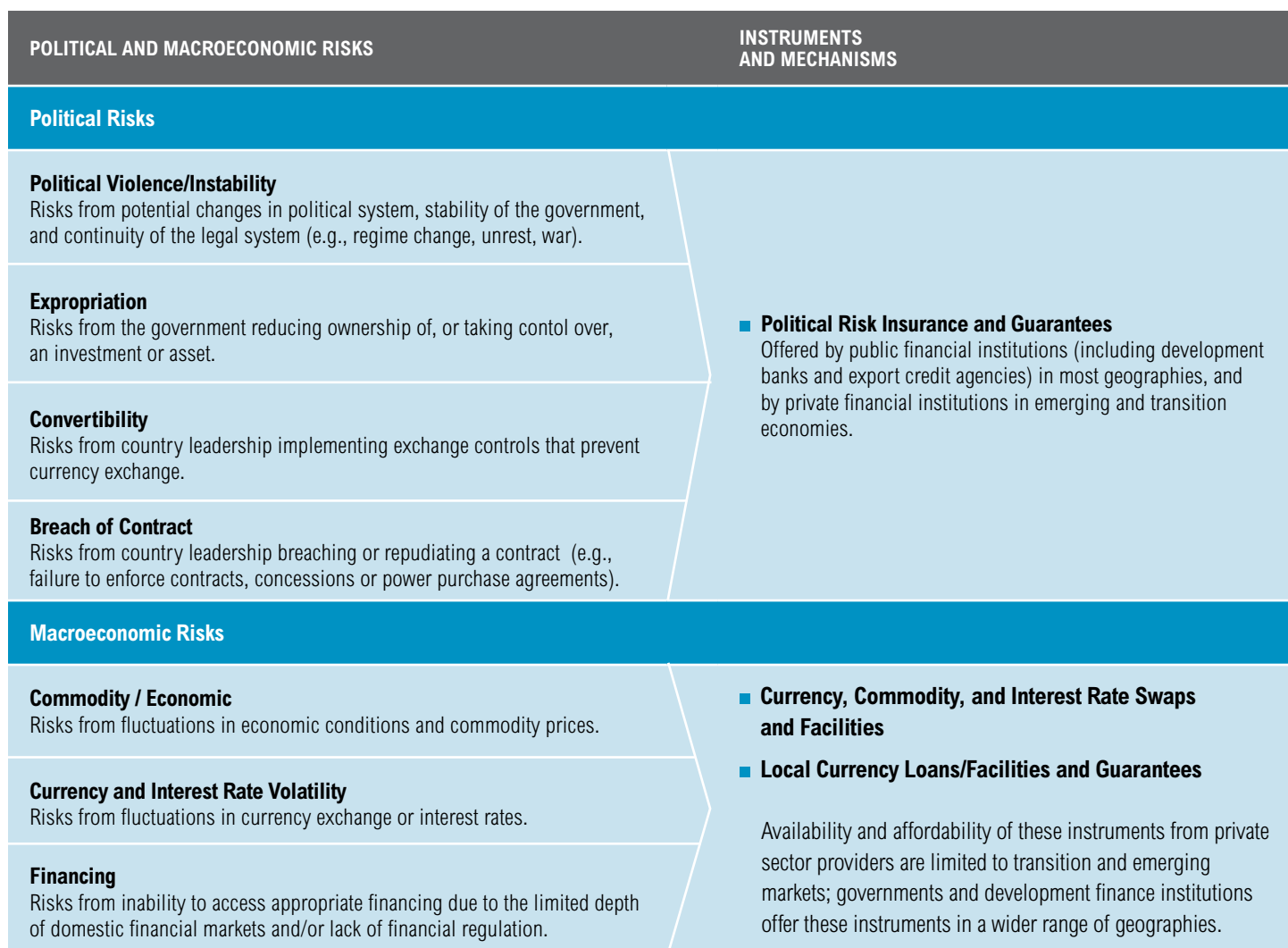
Instituting a carbon price (that is, requiring an economy to value the societal and economic costs of greenhouse gas emissions) is arguably the most efficient way to create an attractive investment environment for low-carbon sectors. Doing so ensures that private sector investment in low-carbon sectors is appropriately rewarded relative to investments in “dirtier,” fossil fuel-dependent, sectors. But, in the absence of either overarching global or domestic carbon pricing, the public sector nevertheless has opportunities to provide other support and finance to reduce low-carbon policy and technology risks that currently discourage private sector investment.

a. Policy-Related Risks

Policies providing monetary incentives and other regulatory support for specific low-carbon sectors naturally improve the risk-reward calculus of these sectors. Examples of these policies include tax credits for low-carbon projects and feed-in tariffs, which provide price support to account for the currently higher relative costs of renewable electricity generation.

If low-carbon policies are repealed through domestic legal processes (“legitimate policy changes”) or are inconsistently enforced or applied, projects benefitting from these policies can be negatively impacted. Changing policies create investment risks even in developed countries. For example, in 2010, Spain implemented a retroactive cut in feed-in tariffs for solar photovoltaic schemes, with the ostensible aim of moderating energy prices. While this policy change could have reduced unnecessary subsidies of a growing solar market, the implementation rendered some projects unexpectedly unprofitable.^{24, 25}

Figure 4 | **Political and Macroeconomic Risks, and Related Public Financing Instruments**



Source: WRI, with information from UNEP report “Catalysing Low-Carbon Growth in Developing Economies” (2009); Standard & Poor’s report “Can Capital Markets Bridge the Climate Change Financing Gap” (2011); ODI Background note “Leveraging Private Investment: the Role of Public Sector Climate Finance” (2011); McKinsey Sustainability & Resource Productivity “Energy Efficiency: A Compelling Global Resource” (2010).

Insurance against legitimate policy changes like Spain's change in feed-in tariffs are not widely available, even in developed countries. A few public financing institutions, including the U.S. Overseas Private Investment Corporation (OPIC), are piloting "regulatory risk" insurance products that can protect financiers against these unexpected, but legitimate, policy changes. Theoretically, such a product could guarantee investment returns if, and when, current/projected losses are triggered by specific types of legitimate policy changes. Figure 5 summarizes policy risks and related public financing instruments.

b. Technology and Operational Risks

TECHNOLOGY RISKS

Low-carbon markets are often dependent on new technologies that generate revenues while reducing energy use and/or greenhouse gas emissions. The use of newer technologies is associated with several investment risks (Figure 5), which prevent these markets from growing since the private sector may not be willing to absorb these risks.

- Performance-related risks stem from the uncertainty of how well a new technology and its components will perform—that is, be able to generate profits. For example, Germany's first operating off-shore wind park, Alpha Ventus was temporarily derailed in 2010 after two turbines overheated and failed, resulting in unexpected replacement costs.^{26, 27}
- Obsolescence risks stem from the potential for future, competing technologies to supplant current technologies. This risk is particularly relevant for sectors where technology has yet to demonstrate its financial viability, but can also apply to more established markets.
- Exit risks refer to the risk capital-providers face in retrieving their capital investment in a project. Since projects dependent on new technologies may take many years to generate revenues, investors typically find it difficult to withdraw and re-sell the finance provided to such a project; this creates significant barriers to market growth. Furthermore, in some developing countries, sufficiently robust financial markets may not exist to facilitate such trades.
- New Market Financing risks are associated with accessing funding—at reasonable terms (for example, accessing a loan with an affordable interest rate and repayment schedule)—to cover both upfront and

ongoing project costs of new technologies. Finance-related risks are prevalent in new technology projects since capital providers find it challenging, or may be unwilling to, assess the risks of these projects.

In emerging markets, private sector venture capital providers commonly provide equity investments to fund new technologies. But this type of private sector finance is not as easily accessible in other developing countries. The public sector can help to fill this gap and move new technology projects to commercialization using instruments such as grants, concessional loans, and equity investment. Even if this kind of public finance does not leverage large amounts of private capital initially, this support can foster future private capital flows by demonstrating the commercial viability of a sector and its projects, thereby increasing private sector interest in similar, future transactions.

To scale-up low-carbon markets that have already demonstrated commercial viability, the public sector can:

- Increase private sector comfort with low-carbon investments through actions like investing in new low-carbon projects to signal their financial viability; helping the private sector—including both capital providers and project developers—learn how to evaluate such projects; and building the experience of capital providers in evaluating, and lending to, these projects. For example, the World Bank Group often uses private sector commercial banks as intermediaries for energy efficiency finance. The Energy Efficiency Facility for Industrial Enterprises in Uzbekistan employed this model by creating a dedicated energy efficiency facility that was funded by both the public and private sectors. This dedicated facility provides credit lines to private sector financial institutions; the capital from these credit lines is then "on-lent" to energy efficiency projects. This type of "on-lending" by the private sector can sometimes lead to the future leverage of private capital flows as private sector lenders become more comfortable evaluating and financing low-carbon projects.
- Pool projects to be financed by a single financing entity, thereby decreasing overall transaction costs relative to the transaction costs of financing each project individually.

Figure 5 | **Low-Carbon Market Risks and Related Public Financing Instruments**



Source: WRI, with information from UNEP report “Catalysing Low-Carbon Growth in Developing Economies” (2009); Standard & Poor’s report “Can Capital Markets Bridge the Climate Change Financing Gap” (2011); ODI Background note “Leveraging Private Investment: the Role of Public Sector Climate Finance” (2011); McKinsey Sustainability & Resource Productivity “Energy Efficiency: A Compelling Global Resource” (2010).

* Note: For example, support for policies like Feed-in-Tariffs, carbon markets, renewable fuel standards, retrofitting and fuel standards, tax / trade incentives, and repealing of fossil fuel subsidies.

Box 5 | Barriers and Solutions to Scaling-Up Investment: Energy Efficiency and On-Grid Renewable

ENERGY EFFICIENCY

Barriers to the scale-up of private sector investment in energy efficiency in developing countries include:

- Price distortions due to inadequate regulation²⁸ and subsidized energy tariffs;
- Lack of awareness and technical capacity to take advantage of energy efficiency measures;
- Misaligned incentives between asset owners and energy users;
- Inaccurate risk perceptions from asset owners, users, and lenders; and
- Lack of favorable financing.²⁹

In addition to broad energy policy reform to correct price distortions and regulatory standards to improve baseline energy efficiency, other forms of relevant public support to leverage private sector participation include:

- Support Mechanisms
 - Technical support for third party energy efficiency service providers (ESCOs) to correct market distortions; and
 - Support for technology demonstration and diffusion of energy efficiency technologies.
- Public Financing Instruments
 - Direct finance to ESCOs and/or companies to execute projects; instruments can include guarantees, dedicated financing facilities, grants, credit lines, and concessional finance.
 - On-lending through private sector financial intermediaries to improve financing comfort and awareness.

RENEWABLE ENERGY: ON-GRID SOLAR AND WIND

Some investors find renewable energy projects less attractive relative to traditional projects due to their high upfront capital costs and long-term financing requirements. Other market barriers include:

- Domestic regulations, subsidies and financing are geared toward fossil fuel-based sectors;³⁰
- Lack of connecting grid infrastructure;
- Limited technical/labor capacity to execute and maintain projects cost-effectively;
- Inability to access non-recourse finance, especially for smaller projects;³¹
- Limited track record of power purchase agreements (PPAs);³²
- High transaction costs associated with smaller renewable energy projects; and
- Intermittent nature of renewable power³³ (for example, due to wind variability).

Public support mechanisms and financing instruments to address these barriers include:

- Support Mechanisms
 - Feed-in tariff policies that improve the relative profitability of renewable power over an appropriate timeframe;
 - Reduction of subsidies and incentives for fossil fuel-driven sector;
 - Technical assistance to help create standardized PPAs for smaller projects;³⁴ and
 - Technical assistance to improve siting, and thus, capacity utilization of installed capacity;³⁵
- Public Financing Instruments
 - Longer duration loans to improve debt service coverage ratios—a key ratio used by financiers to determine whether a project is financeable;³⁶
 - Guarantees and regulatory risk insurance; and
 - On-lending through private financial intermediaries to improve financing comfort and awareness.

Sources: WRI, with information from GEF report “Investing in Energy Efficiency: The GEF Experience” (year unknown), IBRD report “Climate Change and the World Bank Group” (2010), WEF report “Scaling Up Low Carbon Infrastructure Investments in Developing Countries” (2011), and CIF report “Kenya: Scaling-Up Renewable Energy Program” (2011).

OPERATIONAL RISKS

Operational risks—which manifest during the construction or operations phase of a project—can delay project revenues and/or increase project costs. For example, if a project is not able to meet local government compliance requirements or receive permits in time to start project operations, the receipt of revenues may be delayed and/or reduced. The extreme weather impacts of climate change are also important drivers of operational risks as physical damage to project assets may result in significant costs and project delays. In some geographies and sectors, operational risks may stem from the lack of low-carbon technical expertise and certification processes, which limit access to appropriate labor resources. Finally, without access to adequate infrastructure—for example, if a wind farm is unable to access the municipal electricity grid or dependable transmission lines—project revenues may not measure up to production capacity.

To protect capital providers and project developers from unexpected operational risks in more mature markets, the public sector can use loan guarantees and weather-related insurance products, respectively. In nascent markets, other forms of public support like grants and technical assistance (for example, for labor training) are the most appropriate way to support future private sector investment. Figure 5 summarizes technology and operational risks and related instruments.

Beyond the two categories of investment risks, political/macroeconomic and low-carbon market, outlined above, each geography, sector, and project will face a unique set of constraints that has implications on investment attractiveness. While a full analysis of all market sectors is beyond the scope of this paper, Box 5 presents brief case studies of two relatively mature low-carbon sectors—energy efficiency and solar/wind renewable energy—to demonstrate how public financing instruments can, or have, helped address the specific risks and barriers to market growth.

SECTION III: TARGETING THE USE OF PUBLIC FINANCING INSTRUMENTS

Drawing on Figure 2's framework, this section further describes the public financing instruments identified in this primer. Readers may refer to Appendix 1 for definitions and figures illustrating the mechanics of each instrument type, and to Appendix 2 for additional literature discussing complementary policy support mechanisms.

Lending (Debt)

Borrowing money allows a project/company to access critical funds to cover upfront costs (through capital loans), temporary costs (through bridge financing or credit lines), or ongoing costs (through bonds and long-term loans). From an investor's perspective, lending and making debt investments are less risky than equity investments because lenders/debt investors are paid back before equity investors if a project/company falls into financial trouble. From a borrower's perspective, debt products also provide low-cost finance without relinquishing ownership.

Debt most effectively supports projects when its terms—including the interest rate and repayment schedule—match the requirements or needs of the borrower. Low-carbon projects, like on-grid solar installations³⁷ or transportation infrastructure, have high upfront costs, making a longer repayment schedule especially important because it may take years before a project/company can recover its initial investment and pay the loan principal back to the capital provider. Specific lending/debt public finance instruments and their optimal targeting are outlined below:

- **CONCESSIONAL/FLEXIBLE LOANS AND CREDIT LINES:** Concessional loans feature flexible features like low interest rates and/or long repayment schedules. These features reduce a project's ratio of debt repayment to revenue annually. This type of financing is often used in established renewable energy sectors like wind and solar, where a small reduction in costs or greater flexibility can support the financial viability of projects. By providing this type of concessional finance, the public sector can also leverage private capital investment by signaling confidence in a project. Concessional finance also lowers a project's overall capital financing costs, thus increasing its profitability. This increased profitability allows a project to more easily pay back other lenders and also increases the project's equity value.

Concessional credit lines—which allow a project/company to borrow funds up to a certain threshold as needed, and typically on a short-term basis—can provide invaluable financing to established projects to cover short-term costs or as a bridge to longer-term finance.

■ **CONCESSIONAL / FLEXIBLE LENDING THROUGH FINANCIAL INTERMEDIARIES:**

The public sector can also leverage private capital using concessional finance routed through private sector financial intermediaries (for example, commercial banks). The energy efficiency sector is ripe for this type of financing; despite the financial viability of many energy efficiency projects, private sector lenders often lack experience and comfort with energy efficiency project finance, making it difficult for borrowers to access finance.³⁸ To increase the private sector’s willingness to lend to low-carbon markets, the public sector can provide private sector lenders with concessional (that is, subsidized) loans. These loans are then re-loaned by private sector lenders to energy efficiency projects at market rates, allowing both private sector lenders and the projects to benefit from the public sector’s concessional finance. Through this “on-lending” model, the public sector can support the scale-up of—and eventual transition to—a completely private sector-supported market.

■ **PUBLIC CONTRIBUTION TO DEBT FUNDS/LOAN FACILITIES:**

In less mature markets, it may be impossible to attract private sector investment simply due to the lack of functioning private capital markets. In such cases, an alternate model of public lending through an international debt fund can leverage international sources of private capital through aggregation. A debt fund is a financial mechanism that aggregates loans to several different projects or companies, thereby allowing debt capital providers to diversify their lending and reduce their overall investment risk, despite the presence of riskier borrowers. Public sector support for a dedicated low-carbon debt fund can (i) increase private sector interest in smaller investments since the aggregation of investments reduces overall transaction costs and (ii) improve the risk-reward calculus for private investors if the public sector actor is prepared to take what is called a “first loss” or subordinated position in the debt fund. In this first loss or subordinated position, the public sector actor absorbs some portion of the initial losses to the fund when triggered by borrowers defaulting on their repayments.³⁹ While debt funds can help address investor concerns, they can still be challenging to implement, as shown in Box 6.

Box 6 | The Challenge of Using Debt Funds in Developing Countries

Debt funds can be challenging to implement in developing countries. Private sector investors typically demand that the fund and its activities are governed by the laws of a developed country, and that investor rights can be enforced in the case of a borrower’s delayed payments or defaults. This private sector demand makes it difficult for debt funds to attract private investment if lending is directed to underdeveloped markets—where it is most needed. Due in part to this challenge, it is difficult for public debt funds focused on less developed countries to leverage private capital. Thus far, the public sector—particularly multilateral development banks—have been more successful in leveraging private capital through debt fund/loan facilities for energy efficiency and renewable energy projects in transition countries (for example, countries in Eastern Europe). Incorporating a de-risking instrument into such funds is one method to help address this private sector investor concern.

Source: WRI.

Equity Investments

Equity is the other critical component of a project/company’s capital structure, and represents ownership in a project/company. Without adequate equity a project/company cannot grow since lenders will be reticent to provide capital to a project/company that does not have a basic level of internal funding. Furthermore, large equity infusions can help a project/company signal to other equity investors that a project is viable, thus unlocking additional finance. As in the case of debt, the public sector can use various instruments to provide equity support:

- **DIRECT EQUITY INVESTMENT:** Direct equity investments into a project/company allow a project/company to (1) raise additional capital through other financing mechanisms since equity can absorb potential losses to other financiers; and (2) use its equity to invest in assets and activities which allow the project/company to grow. For example, the private sector-focused divisions of some multilateral and bilateral institutions (such as the International Finance Corporation and

the French development agency, Proparco) can invest directly in private sector projects, alongside other private sector investors. Direct equity investment is valuable for both early-stage demonstration projects (pre-commercial stage) and those projects in more established sectors⁴⁰ to help attract additional financing and expand projects.

- **QUASI-EQUITY:** Quasi-equity investments exhibit a mix of debt and equity characteristics, and fall between debt and equity in a company’s capital structure.

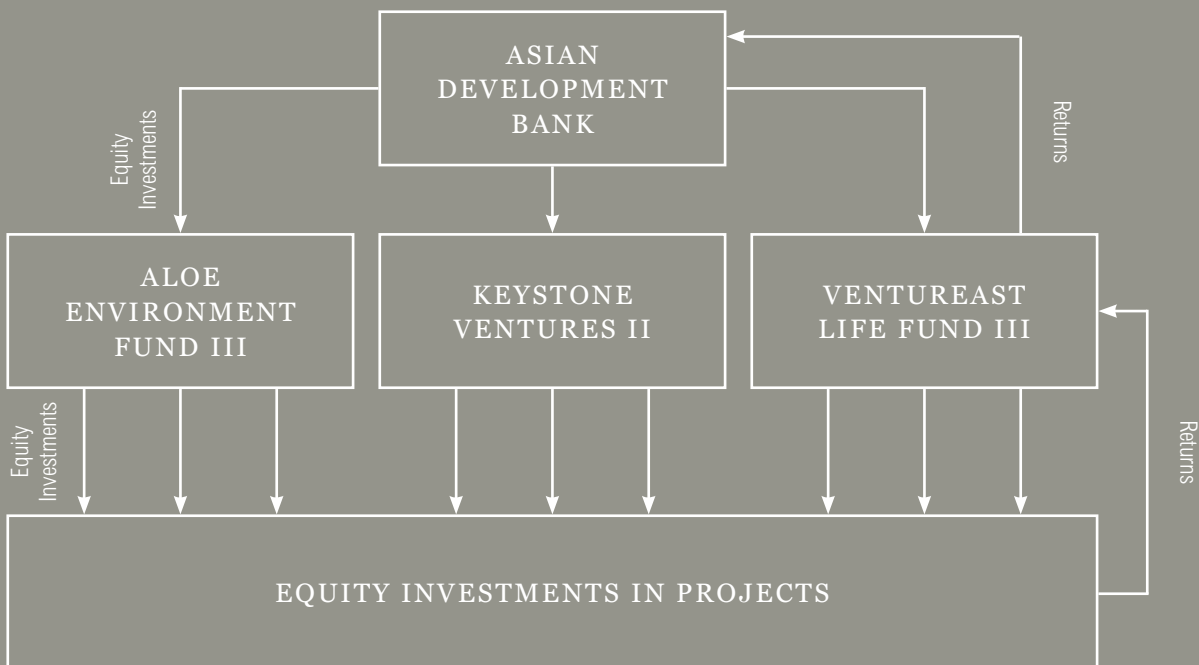
Typically, a quasi-equity investor faces greater risk than a debt investor since quasi-equity investors are paid after debt investors (and before equity investors). But unlike a debt investor, a quasi-equity investor may achieve a return beyond his/her principal and interest if the project/company investee achieves a profit or growth. From the company/project perspective, securing quasi-equity finance can allow a project/company to more easily access additional debt or equity financing from other private sector lenders.

Box 7 | Case Study: Asia Climate Change and Clean Energy Venture Capital Initiative

Launched in May 2011, the Asian Development Bank’s (ADB) Asia Climate Change and Clean Energy Venture Capital Initiative (AVCI) is a public investment mechanism whose purpose is to accelerate private sector-based innovation, transfer, and diffusion of climate change mitigation and adaptation technologies by providing an equity infusion into venture capital funds that will invest in early-stage climate technology companies. Currently funded at USD \$62 million, it is targeting a scale of USD \$600-700 million from a combination of public and private investors.

AVCI targets green technology investments in China, India, and Southeast Asia through three sub-funds—Aloe Environment Fund III, Keystone Ventures II, and VenturEast Life Fund III—that aim to leverage additional private sector investment.

Source: WRI, based on information from the Asian Development Bank.



- **EQUITY FUNDS:** Because taxpayer money cannot typically be used to assume ownership in private sector companies or projects, many public institutions are not able to provide direct equity investments. For these institutions, investments in equity funds can provide an alternate financing route. Equity funds pool resources together and invest equity in a portfolio of diversified projects or companies. As in the case of debt funds, public contributions to low-carbon equity funds can help de-risk private sector investor positions in a fund by taking on first-losses or other risky positions within the fund, or even just simply by signaling its investment comfort in a fund. Like debt funds, generally, the riskier a position the public sector takes, the more likely it is to leverage private sector capital. In equity funds, unlike debt funds, the public sector can also take subordinate positions on profits, implying that other private sector investors would be first in line to reap the benefits of any fund profits, but that the public sector still benefits from any remaining profits. Box 7 provides an example of how an equity fund with public contributions may be used to fund low-carbon projects in developing countries.
- **INTEREST RATE, CURRENCY-RELATED DERIVATIVES AND FACILITIES:** Interest rate/currency derivatives and facilities provide project developers and capital providers with protection against macroeconomic and political volatility. Unfortunately, there are limited providers of interest rate and currency derivatives, and exchange rate facilities, in less developed countries—due to the small size of these markets and the high probability of such risks—making it difficult for low-carbon project developers in these countries to manage such risks.
- **PARTIAL RISK AND CREDIT GUARANTEES:** Partial risk and credit guarantees are critical de-risking instruments provided by development finance institutions, and are employed when a government agency hires a private sector developer or seeks additional private sector co-financing for a project. These guarantees are commonly used for infrastructure projects which are executed through public-private partnerships or use private sector finance given their large size, ability to generate revenues and to repay debts, and need for private sector technical expertise.

Partial risk guarantees support commercial borrowing for public investment projects by partially covering private lenders against the risk of repayment default by the public sector. Partial credit guarantees—which are used in low-income countries as defined by the World Bank Group—work similarly by covering private lenders against the risks of a public entity failing to perform its contractual obligations in a private sector investment project.

In some cases, the demand to de-risk investments will come directly from project developers looking to reduce their operating risks. In other cases, private—and sometimes public—sector capital providers, will require project developers to purchase de-risking products to protect the capital providers' investment. The success of these instruments in leveraging private capital will ultimately vary by the size of domestic private capital markets in a given geography.

De-Risking Instruments

Section II describes several types of de-risking instruments and how they can improve the risk-reward calculus of projects. The mechanics of these de-risking instruments are described here.

- **POLITICAL RISK GUARANTEES:** Political risk guarantees are especially useful in less developed countries where the first barrier to investment is risk relating to the country's political and macroeconomic environment. Political risk guarantees can be instrumental to spurring low-carbon market development, but public sector institutions have only recently increased their use of guarantees. The World Bank Group's Multi-Lateral Insurance Guarantee Agency, for example, has provided fewer than 10 guarantees to climate change-relevant sectors between January 2005 and January 2012, based on publicly available data.

NEXT STEPS

As private sector investment grows in developing countries, the public sector has a window of opportunity to redirect these investment flows to low-carbon markets by improving these markets' risk-return profile, size, liquidity, and transparency. As discussed in this primer, the public sector can seize this opportunity by complementing broad-based policy support with the targeted use of financing instruments.

To leverage private capital most effectively, public sector actors will need to assess how their policy support and use of financing instruments can best be employed across different geographies (including those where access to finance is limited) and aligned with on-the-ground needs. Specifically, public actions should

- Catalyze private capital flows to maximize the impact of public sector dollars. This includes focusing on geographies where investment is most needed and where private capital will not otherwise flow;
- Reduce greenhouse gas emissions and support low-carbon development at the lowest possible cost to the public;
- Consider the economic and development ambitions of recipient countries; and
- Complement other sources of public support and finance.

Meeting these challenging objectives will be a complex task, and may require the public sector to

- Raise more public funds for international climate finance;
- Increase private sector participation by assuming more risk;
- Allocate public sector dollars to markets where it is most difficult to secure financing; and
- Increase internal government coordination and external collaboration with the private sector.

Fortunately, there is a long history of low-carbon and other development financing experience from which public sector actors can draw. Building on this primer's introduction to creating attractive investment conditions by using public financing instruments, future WRI private sector-focused publications will examine the financing experiences of different types of public institutions to ultimately identify how the public sector can most effectively leverage private capital.

UPCOMING PRIVATE SECTOR-FOCUSED PUBLICATIONS IN WRI'S CLIMATE FINANCE SERIES

Subsequent publications in this series will examine recent practices and the role of different types of public and public-private institutions in leveraging private capital. Actors examined will include:

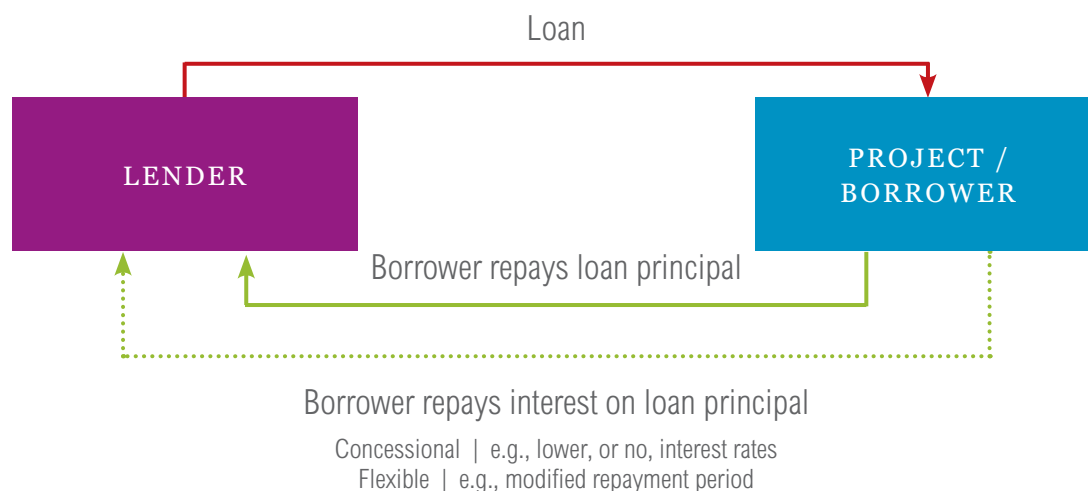
- Multilateral and bilateral development banks,
- Regional and local development banks;
- International public finance mechanisms;
- Public-private funds and initiatives; and
- Government aid and export agencies.

Subsequent publications will be accessible at: <http://www.wri.org/project/climate-finance-private-sector>.

APPENDIX 1: PRIMER ON FINANCING INSTRUMENTS

FINANCING INSTRUMENT	DEFINITION
Lending (Debt)	Lending or debt instruments provide borrowers with upfront funding in exchange for repayment of this funding (known as "principal") along with interest, based on pre-determined timeframes and interest rate terms.
Concessional / Flexible Loans	Concessional and flexible loans include special features like no or low interest rates, extended repayment schedules, and interest rate modifications during the life of the loan.
Concessional / Flexible Loans through Financial Intermediaries	Loans provided to projects through financial intermediaries, like commercial banks, under concessional / flexible terms. The public sector typically uses this financing approach to increase the comfort and awareness of financial intermediaries in lending to new or less established markets.
Debt Funds	See "Funds and Structured Products" category.

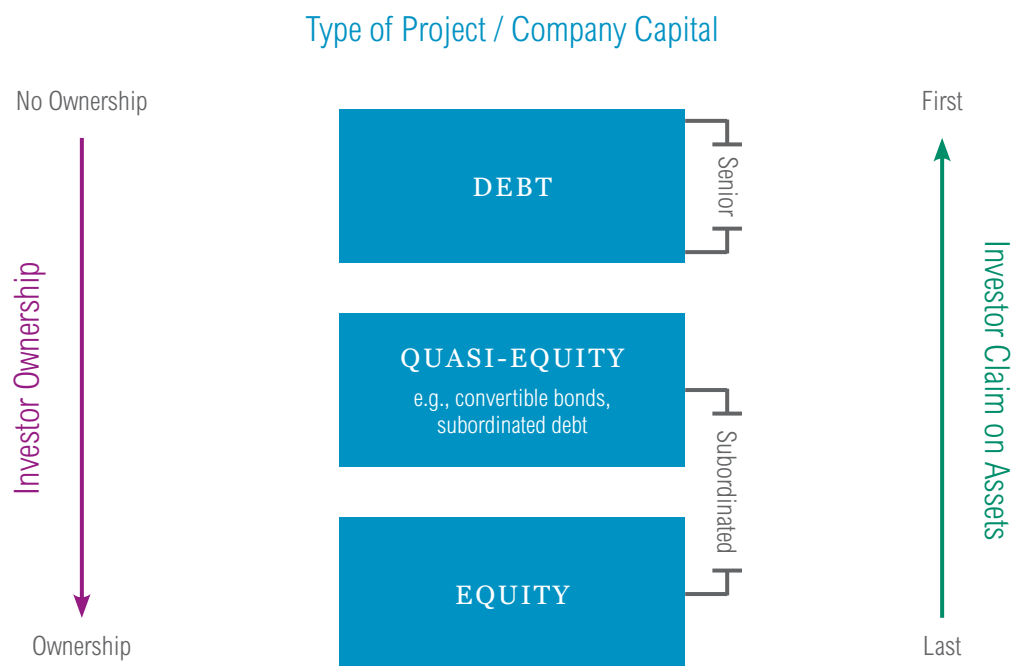
Lending (Concessional / Flexible Loans)



APPENDIX 1: PRIMER ON FINANCING INSTRUMENTS (CONT.)

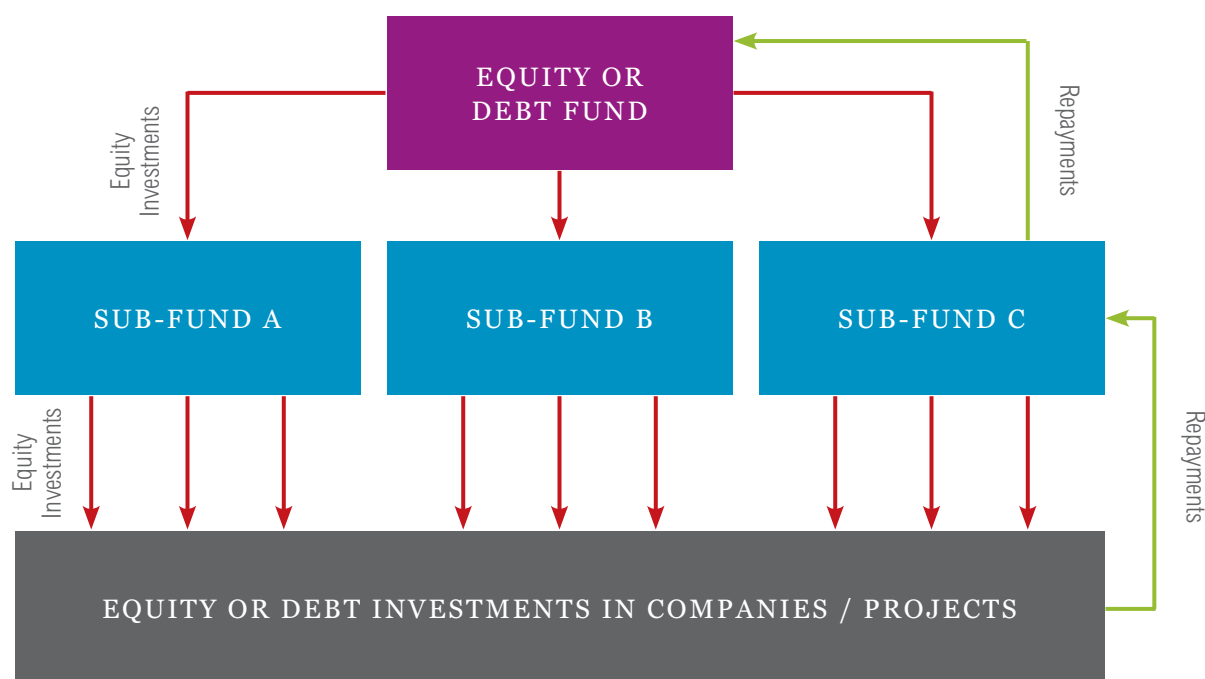
FINANCING INSTRUMENT	DEFINITION
Equity and Quasi-Equity Investments	Equity investments provide a critical capital base for a company or project to grow its operations, access other sources of finance, and reduce investment risks faced by other project/company investors, especially debt investors who are repaid before equity investors.
Direct Equity Investment	Direct capital contribution to a project without the guarantee of repayment; the return on a direct equity investment will depend on the performance of a project/company over the investment period.
Equity Funds	See "Funds and Structured Products" category.
Quasi-Equity	Quasi-equity investments exhibit a mix of debt and equity characteristics in terms of ownership and claim to assets in the case of default. These investments' risk-return profile typically fall between debt and equity in a company's capital structure. Some types of quasi-equity may be converted from possessing debt to equity characteristics, and vice versa.
<ul style="list-style-type: none"> ■ Convertible Bonds 	A type of bond that can be converted into shares of common stock in the issuing company, or into cash of an equivalent value. A convertible bond is essentially a bond with a stock option; because interest is paid before any stock dividends, this is a safer instrument for the lender relative to an equity investment.
<ul style="list-style-type: none"> ■ Subordinated Debt 	Riskier than traditional debt, subordinated debt has a lower claim on assets; that is, if a project/company falls into bankruptcy, subordinated debt will be repaid only after other, more "senior" debt is repaid. While subordinated debt is a riskier investment, investors can potentially achieve higher returns from subordinated debt investments relative to traditional debt.

Equity and Quasi-Equity



FINANCING INSTRUMENT	DEFINITION
Funds and Structured Products	Funds and structured products allow investors to diversify their investments (thus improving their aggregate risk-reward profile) and reduce investment transaction costs, and improve borrower's access to finance especially for smaller projects.
Debt and Equity Funds	Pooled investments in debt or equity of several projects and/or companies. The objective of debt funds is to preserve capital and generate income. The objective of equity funds is investment growth through capital gains or dividends. Both debt and equity funds may invest in sub-funds to further leverage their investment.
Structured/Securitized Products	A broad class of highly customized investments where pools of assets, such as mortgages, are aggregated to create a new security, which is then divided up and sold to investors with different risk-return tolerances. These securities' repayment value depends on the performance of the underlying assets.
Pledge Funds	A targeted private equity fund working towards a specific investment goal. Members make defined contributions to the investment pool over a period of time. Such an approach allows individual investors to consider investment opportunities on a case-by-case basis and is often used as a format for venture capital investing.

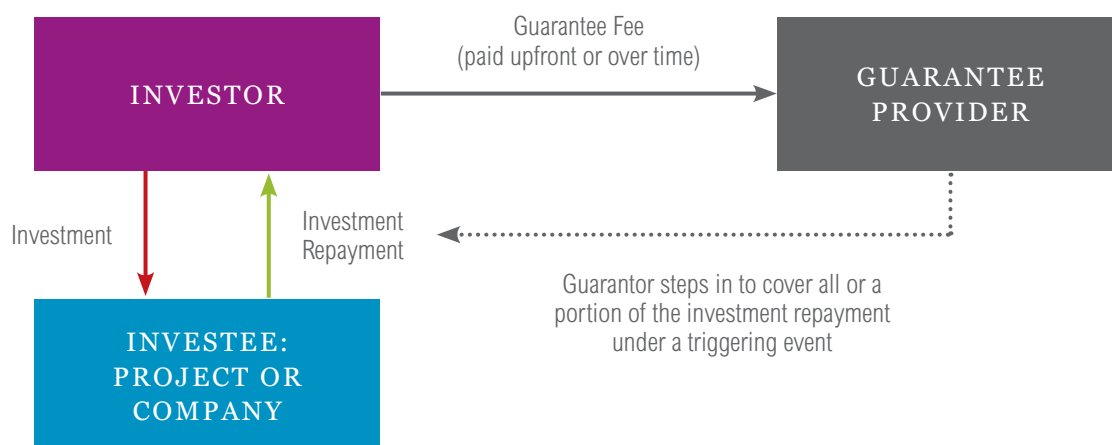
Equity or Debt Fund



APPENDIX 1: PRIMER ON FINANCING INSTRUMENTS (CONT.)

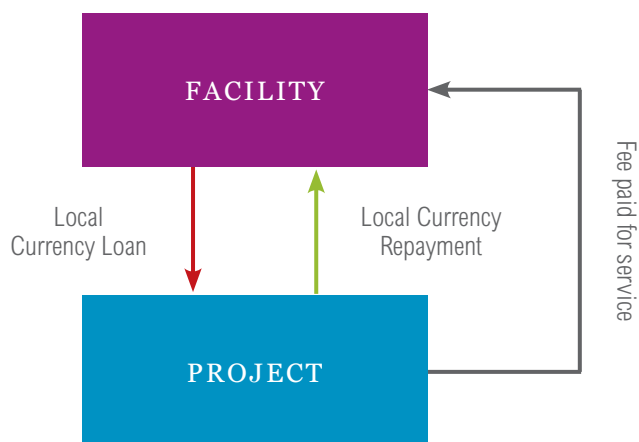
FINANCING INSTRUMENT	DEFINITION
De-Risking Instruments	De-risking instruments help investors reduce or manage investment risks, typically in exchange for a fee, and thus, improve the perceived risk-reward profile of an investment.
Insurance and Guarantees	Insurance and guarantee products protect investors from a borrower's failure to repay as a result of pre-specified events. A guarantee can be a minimum guarantee that protects a portion of the investment through its lifetime, or a back-end guarantee that covers the entire investment after a pre-specified timeframe.
<ul style="list-style-type: none"> Political Risk 	An insurance/guarantee that protects against borrower failure to repay as a result of political events such as governmental expropriation of assets, currency transfer restrictions or inconvertibility, breach of contract, war & other civil disturbances, etc. If such an event occurs and repayments are disrupted, political risk insurance/guarantees pay out all or a portion of the losses that arise due to the event.
<ul style="list-style-type: none"> Partial Risk 	Partial risk guarantees cover private sector lenders against the risks of a public entity failing to perform its contractual obligations to a private sector project. These obligations are usually non-commercial (political, regulatory, etc.) in nature.
<ul style="list-style-type: none"> Partial Credit 	Partial credit guarantees—which are used primarily in poorer countries—support commercial borrowing for public investment projects by partially covering private sector lenders against the risk of debt service default by the public sector.

Guarantee / Insurance Product



FINANCING INSTRUMENT	DEFINITION
De-Risking Instruments	De-risking instruments help investors reduce or manage investment risks, typically in exchange for a fee, and thus, improve the perceived risk-reward profile of an investment.
Local Currency Loans and Facilities	Cross-border loans that are disbursed in local currency and thus, protect the borrower from foreign exchange risks that could otherwise result from the mismatch of earning revenues in local currency while repaying debt in foreign currency; a fee may be charged for these services.
Liquidity Facilities	A financial arrangement, such as a line of credit, used to provide critical short-term cash flow to a project or company. A foreign exchange liquidity facility is a type of liquidity facility that allows borrowers to draw upon the facility to help manage fluctuations in foreign exchange rates.

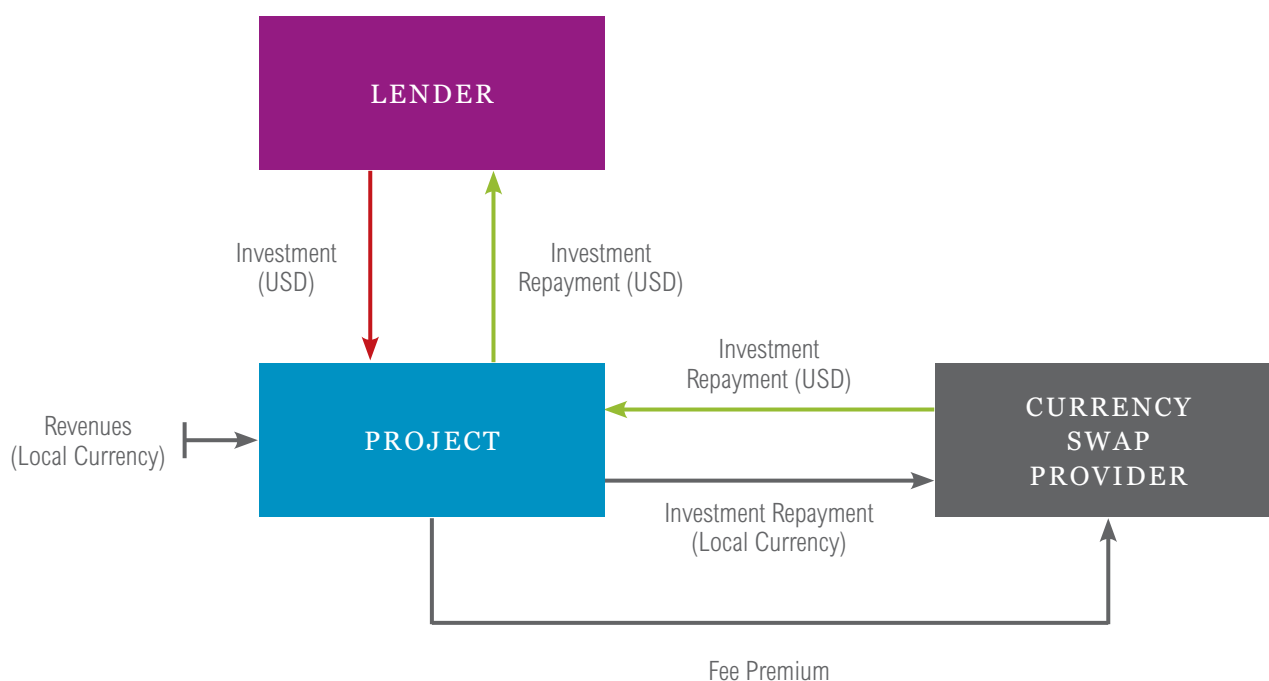
Local Currency Loan / Facility



APPENDIX 1: PRIMER ON FINANCING INSTRUMENTS (CONT.)

FINANCING INSTRUMENT	DEFINITION
De-Risking Instruments	De-risking instruments help investors reduce or manage investment risks, typically in exchange for a fee, and thus, improve the perceived risk-reward profile of an investment.
Swaps/Derivatives	Financial agreements that typically supplement other financing instruments to help manage different types of risks faced by an investor or borrower. These agreements are customized to protect against a specified set of risks in exchange for an upfront fee or ongoing premium. These agreements typically involve an exchange of cash flows with a third party entity or financing mechanism.
<ul style="list-style-type: none"> Weather-Indexed 	These agreements reduce the borrower's risks associated with adverse weather conditions. For example, farmers can use weather-indexed swaps/derivatives to hedge against poor harvests due to low levels of rainfall.
<ul style="list-style-type: none"> Interest Rate 	These agreements protect the borrower against changes in interest rates; for example, an agreement may convert an adjustable interest rate that frequently resets or "floats," to a fixed interest rate, or vice versa.
<ul style="list-style-type: none"> Currency 	These agreements protect the borrower against changes in currency exchange rates; for example, an agreement may convert one type of currency to another at a pre-determined rate regardless of prevailing market exchange rates over the agreement period.
<ul style="list-style-type: none"> Commodity 	These agreements protect the borrower against changes in commodity prices and are highly relevant to markets that depend on certain commodities (for example, agriculture-based or oil-dependent markets); for example, an agreement may fix the price of a commodity over the agreement period regardless of the underlying commodity's prevailing market price.

Swap Example: Currency Swap



APPENDIX 2: ADDITIONAL READING RESOURCES

A. Using Public Resources to Leverage Private Sector Participation

Barclays / Accenture

Carbon Capital: Financing the Low Carbon Economy, February 2011; http://group.barclays.com/html_phase_2/assets/docs/reports/Carbon-Capital_-_Financing-the-low-carbon-economy.pdf.

Chatham House

Unlocking Finance for Clean Energy: The Need for 'Investment Grade' Policy, December 2009; http://www.chathamhouse.org.uk/files/15616_1209pp_hamilton.pdf.

Climate Strategies

Mobilising Private Finance for Low Carbon Development, 2011; <http://www.climatestrategies.org/component/reports/category/71/334.html>.

Global Green Growth Institute

The role of public-private cooperation in enabling green growth, 2011 http://www.globalgreengrowthforum.com/fileadmin/user_upload/3GF_2011_Report_01.pdf.

Grantham Institute

(London School of Economics)

Meeting Climate Challenge: Using Public Funds to Leverage Private Investment in Developing Countries, September 2009; <http://www2.lse.ac.uk/GranthamInstitute/publications/Other/Leveragedfunds/Meeting%20the%20Climate%20Challenge.aspx>.

International Finance Corporation

Climate Finance: Engaging the Private Sector, 2011; http://www1.ifc.org/wps/wcm/connect/5d659a804b28afee9978f908d0338960/ClimateFinance_G20Report.pdf?MOD=AJPERES.

Overseas Development Institute

Leveraging Private Investment: The Role of Public Sector Climate Finance, April 2011; <http://www.odi.org.uk/resources/download/5701.pdf>

Japan's Private Climate Finance Support: Mobilising Private Sector Engagement in Low Carbon Development, 2012; <http://www.odi.org.uk/resources/docs/7589.pdf>.

Pew Center for Global Climate Change

Strengthening International Climate Finance, 2010; <http://www.pewclimate.org/docUploads/strengthening-international-climate-finance.pdf>.

PricewaterhouseCoopers

Business Leadership on Climate Change Adaptation: Encouraging Engagement and Action, 2010; <http://www.pwcwebcast.co.uk/encouraging-engagement-and-action-full-report.pdf>.

Standard & Poor's

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Stockholm Environment Institute

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APPENDIX 3: INITIATIVES FOCUSED ON USING PUBLIC CLIMATE FINANCE TO LEVERAGE PRIVATE CAPITAL

The following tables provide examples of donor government, development bank, research organizations, and private sector efforts that examine how best to use public climate finance to leverage private capital in climate change-relevant projects. They provide an illustration, rather than an exhaustive list, of the range of research and convening initiatives focused on this topic.

PUBLIC SECTOR INITIATIVES

UK Government's Capital Markets Climate Initiative (CMCI) aims to bring the London-based finance community together with the UK Government to identify ways to facilitate the scale-up of private sector climate finance flows.

The former UNEP Sustainable Energy Finance Initiative (SEFI) worked with financiers to provide tools and support to drive financial investment in clean energy technologies. SEFI fostered investment in projects, by developing partnerships and creating the momentum needed to bring sustainable energy into the mainstream.

Global Green Growth Institute, an initiative of Danish and South Korean governments, this institute convenes a range of public and private stakeholders on an annual basis to strengthen global public-private partnerships for the industrial transition to a green economy.

The new Green Climate Fund (GCF) (including its Private Sector Facility), to be launched in coming years, will provide a useful international platform to test the leveraging tools available to public financiers.

Working Group on the International Financial Aspects of Climate Change is an initiative of the EU and looks at ways to leverage private investments for low carbon projects in developing countries.

International Development Finance Club (IDFC) is a network of national and sub-regional development banks committed to sharing best practices in international development and climate finance.

Multilateral, bilateral institutions and donor government agencies have supported research and implementation projects to improve the effectiveness of development banks in leveraging private capital.

Multilateral institutions include the World Bank Group, Asian Development Bank, Inter-American Development Bank, and the African Development Bank.

Bilateral institutions from Germany (BMU, KfW, GIZ), France (AFD), Sweden (SIDA), UK (DFID, DEFRA, DECC), Japan (JICA and Environment Ministry), US (State Department/USAID), Netherlands, Norway, Denmark, and the United Nations (UN) have either supported or contributed to research projects to understand the role of the public sector in leveraging the private sector.

International mechanisms like the Climate Investment Funds (CIFs), the Global Environment Facility (GEF), and the proposed Green Climate Fund (GCF) are examining best practices to leverage the private sector using their own funds.

RESEARCH-FOCUSED ORGANIZATIONS

The 2010 Critical Mass Project, a joint initiative of the IFC, the UN Foundation and the World Economic Forum, convened public and private stakeholders to design and implement programs to leverage private investment for low-carbon infrastructure in developing countries.

Climate Policy Initiative, established in 2009, examines a broad range of climate finance issues including aggregate tracking of climate finance flows. In partnership with the World Bank Group, the Organisation for Economic Co-operation and Development and CLP, they recently launched the San Giorgio Group—a working group of key financial intermediaries and institutions focused on how best to scale-up climate finance flows.

Global Climate Network is an international network of progressive research organizations, including the Center for American Progress. These organizations have worked together to identify various financial instruments to leverage private investments in low carbon projects in developing countries.

World Resources Institute launched a cross-Institute initiative in 2011 to understand how best governments, development finance institutions, international mechanisms, and PPPs can leverage private capital while meeting development priorities.

Renewable Energy Finance Project, an initiative of the UK think tank Chatham House, works with leading renewable energy financiers to establish specific policy conditions for investment in various countries.

Brookings Institution broadly examines climate finance issues, including private sector-related topics.

Overseas Development Institute examines the private sector's role in transferring financial resources to vulnerable countries for climate change-relevant projects.

Grantham Institute is a research center at the London School of Economics, headed by Lord Nicholas Stern, with a mission to provide policy relevant research on climate change.

Stockholm Environment Institute conducts research on leveraging private climate finance for adaptation.

Global Financial Mechanism Project, an initiative of WWF, examines the role of private sector in climate finance as part of its larger aim to understand the optimal design and operation of UNFCCC Mitigation Fund.

Frankfurt School/UNEP Collaborating Centre aims to develop and promote cost-effective approaches to mobilizing financing for climate and sustainable energy investments.

Climate Bonds Initiative is an investor-focused not-for-profit promoting large-scale investment in the low-carbon economy through climate-friendly, fixed income products.

APPENDIX 3: INITIATIVES FOCUSED ON USING PUBLIC CLIMATE FINANCE TO LEVERAGE PRIVATE CAPITAL (CONT.)

PRIVATE SECTOR-FOCUSED EFFORTS

Private Sector-Focused Alliances

Global Green Growth Forum (3GF) (affiliated with the Green Growth Institute) is a partnership between governments (Denmark, Korea and Mexico), global corporations, and international organizations, working to create large-scale green projects. 3GF annually convenes a select group of political and business leaders to give momentum to long-term sustainable growth through scalable public-private partnerships.

ClimateWise and the P-8 Group are groups of leading insurers and pension funds, respectively, exploring strategies to address climate change. These groups benefit from the guidance and support of the Cambridge Programme for Sustainability Leadership and the Prince of Wales' Business and Environment Program, among others.

The Investor Network on Climate Risk (INCR) Hosted 500 financial leaders managing \$22 trillion in assets at the United Nations in 2010 to discuss investment opportunities and policy actions for mitigating global climate change.

The Institutional Investors Group on Climate Change (IIGCC) is a Forum of European Investors that influences policy makers and investors towards a low carbon economy.

Ceres is a network of investors, companies, and public inter groups advocating for the acceleration, expansion and adoption of sustainable business practices and solutions critical to a healthy global economy.

UNEP-FI works with financiers to provide the tools, support and networks to drive financial innovation in the climate change space.

A 2012 B20 initiative spearheaded by the World Economic Forum, the Green Growth Action Alliance (G2A2) is a public-private partnership with the aim to address gaps in green infrastructure investment by leveraging private sector participation.

Private Sector-Driven Efforts

HSBC Climate Change Initiatives has published reports on both green bonds and how to scale-up low-carbon markets, among other climate finance related topics.

Bank of America is currently examining the types of financing instruments that the Green Climate Fund's Private Sector Facility should consider.

Standard & Poor's hosted a roundtable and released an associated report exploring the question of capital markets ability to close the climate finance gap.

Bloomberg New Energy Finance tracks investment flows to renewable energy and releases policy-relevant reports aimed at the investment community.

Deutsche Bank Climate Change Advisors have been strong proponents of Feed-in Tariff policies to catalyze renewable energy markets and have released several publications on related topics.

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WRI'S CLIMATE FINANCE SERIES

WRI's Climate Finance series tackles a broad range of issues relevant to public donors, intermediaries, and recipients of climate finance. A subset of this series, including this primer, examines how public climate finance providers—whether governments, development finance institutions, or international finance mechanisms like the proposed Green Climate Fund—can meet the significant investment needs of developing countries by mobilizing private sector investment. It focuses on how the public sector can finance and mobilize investment into private sector projects, but also acknowledges the importance of overarching support for complementary low-carbon policies. Low-carbon sectors specifically considered include renewable energy, energy efficiency, and related infrastructure and services, though lessons may equally apply to other climate change-relevant sectors like sustainable agriculture, transportation, and water infrastructure.

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