



Public Development Banks

Addressing the Challenges of Financing Climate Change Mitigation

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Abstract*

Though the need to scale up financing to mitigate climate change and the associated challenges and barriers are well documented, there has been little discussion of the role that can be played by Public Development Banks (PDBs) — either national or subnational. These institutions have a privileged position in their local markets, strong knowledge of their countries' development needs, and opportunities and vast experience in long-term investment financing. As a result, they are uniquely positioned to catalyze the supply of financing for and stimulate the demand for investment projects to mitigate climate change within their respective countries. This technical note discusses lessons learned from a number of PDBs within the Latin American and Caribbean (LAC) region and examples of best practices, processes and products in support of climate change mitigation from PDBs around the world.

Keywords: Public Development Banks, Latin America and the Caribbean, Climate change, Investment financing

JEL Classifications: G20, G21

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Table of Contents

List of Figures and Tables	ii
Abbreviations	1
Introduction	3
Background	6
Context	6
Public Development Banks	7
Role of PDBs in Financing Climate Change Mitigation	11
Government	12
Private Sector Promoters and Developers, and Associations	13
Technology and Solutions Providers	14
Local Financial Institutions	14
Specialized Agencies	15
Barriers, Risks and Solutions	16
Barriers	17
Risks	18
Measures and Solutions to Mitigate Risks and Overcome Barriers	21
Role of PDBs in Promoting Investments	23
Best Practices	28
Recommendations and Conclusions	35
Recommendations	35
Conclusions	40
Bibliography	42
Annex A: Examples of Dedicated International Climate Funds	46
Annex B: The Kyoto Protocol’s Clean Development Mechanism After 2012	49

List of Figures and Tables

Figure 1: Relationship of PDB to Other Agencies in Financing Climate Change Mitigation Projects.....11

Figure 2: Main Barriers for Energy Projects to Mitigate Climate Change.....17

Figure 3: Risks for a Wind Project..... 18

Figure 4: Performance Risks of Energy Efficiency Projects..... 21

Figure 5: PDB Financing Mechanisms..... 24

Figure 6: PDB’s Institutional Framework for Climate Change Mitigation Activities..... 28

Table 1: Illustrative List of Obstacles and Possible Solutions..... 22

Table 2: Examples of Best Practices for PDBs..... 29

Abbreviations

ADFIAP	Association of Development Financing Institutions of Asia-Pacific
AFD	Agence Française de Développement (French financial institution)
ALIDE	Asociación Latinoamericana de Instituciones Financieras para el Desarrollo (Latin American Association of Development Financing Institutions)
BNDES	Brazilian Development Bank
CDM	Clean Development Mechanism (of the Kyoto Protocol)
CER	Certified Emissions Reductions
CIF	Climate Investment Funds
COFIDE	La Corporación Financiera de Desarrollo (Peru Development Bank)
COFIGAS	Programa de Conversión Financiada a Gas (COFIDE's funded gas conversion program)
CORFO	Corporación de Fomento de la Producción de Chile (Chile Production Development Corporation)
CTF	Clean Technology Fund
DFI	Development Finance Institutions
DUIS	Desarrollos Urbanos Integrales Sustentables (sustainable urban development system)
ERPA	Emissions Reduction Purchase Agreement
ESCO	Energy Services Companies
ETS	Emissions Trading System
EURIBOR	Euro Interbank Offered Rate
FCPF	Forest Carbon Partnership Facility
FIRA	Fideicomisos Instituidos en Relacion con la Agricultura (trust funds for rural development)
FONAGA	El Fondo Nacional de Garantías de los Sectores Agropecuario, Forestal, Pesquero y Rural (Mexico national guarantee fund for agriculture, forestry, fisheries and rural)
GEF	Global Environmental Facility
GHG	Greenhouse Gas
HBOR	Croatian Bank for Reconstruction and Development
IDB	Inter-American Development Bank
IDC	Industrial Development Corporation of South Africa
KfW	Kreditanstalt für Wiederaufbau (German Reconstruction Credit Institute)

LAC	Latin America and Caribbean
LDCF	Least Developed Countries Fund
LFI	Local Financial Institutions
MRV	Monitoring, Reporting and Verification
NAFIN	Nacional Financiera, SNC (Mexico development banking institution)
NEFCO	Nordic Environment Finance Corporation
PDB	Public Development Banks
REDD	Reducing Emissions from Deforestation and Forest Degradation
SHF	Sociedad Hipotecaria Federal
SME	Small and Medium-Sized Enterprises
UNFCCC	United Nations Framework Convention on Climate Change
WFDPI	World Federation of Development Financing Institutions

Introduction

In recent years, a great deal has been written about the need to scale up financing to mitigate climate change and the associated challenges and barriers. The needs of project developers to access financing, as well as the perspective of the project financiers and the insurance sector, have been well documented, as have the enhanced risks faced by such projects compared to more traditional project financing. However, there has been very little focus on the role that could be played by PDBs within developing countries. These banks have a vital leadership role to play in creating a coalition of national and international organizations to catalyze financing on adequate terms and conditions for investment projects to mitigate climate change. Of note, not all PDBs have the capacity or mandate to play this role.

Investment to finance climate change mitigation in developing countries is expected to grow rapidly in the coming years as countries embark on low-carbon development strategies. According to the 2010 World Development Report, additional financing of US\$140 billion to US\$175 billion per year will be required by 2030 to meet the overall goal of limiting global mean temperatures to 2°C above pre-industrial levels. Further, upfront costs to implement renewable energy infrastructure and energy efficiency may be as high as US\$563 billion above business-as-usual investment needs (World Bank, 2009b).

A number of international climate funds that provide highly concessional and/or non-reimbursable financing have already been developed and launched to support activities addressing climate change in developing countries (see Annex A).

More recently, at the 15th and 16th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in Copenhagen and Cancun, respectively, developed countries committed to providing US\$30 billion in “new and additional” resources between 2010 and 2012 (so called “fast-start finance”). The goal is to mobilize US\$100 billion a year from public and private financing sources by 2020 (“long-term finance”). The understanding was that these highly concessional and/or non-reimbursable funds would be dedicated to financing climate change mitigation and adaptation in equal measures. Funding for adaptation would be prioritized for the most vulnerable developing countries (yielding a higher share of funds for mitigation in LAC, which has a very limited number of least developed countries). Further, a significant portion of the funds would flow through a global Green Climate Fund that is presently being designed. While the modes of access to this fund must still be

established, it seems likely that there will be an enhanced role for national financial institutions in developing countries. Indeed, these institutions could be instrumental in channeling and delivering financing and grant support to projects and final beneficiaries at the local level. In many countries, alternative public finance mechanisms are unlikely to have the capacity to efficiently allocate these funds or to effectively catalyze private sector capital domestically.

Even with the ambitious financing objectives established in the Copenhagen Accords, it is clear that funds from developed countries alone will not be sufficient to address the financing needs of developing countries to mitigate climate change. While the mobilization of foreign private capital and of multilateral and bilateral financing will continue to be crucial for developing countries, there is still a considerable gap that will have to be filled by domestic (mainly private) sources of financing.

Thus, independently of the adoption of the Green Climate Fund in the recent Conference of the Parties in Durban and its subsequent entry into operation, there is a need for national financial institutions to develop and/or strengthen their capacity to become catalysts in financing climate change mitigation in their countries while supporting sustainable development and enhancing economic competitiveness.

While there has been extensive discussion about the needs and sources of financing, to date very little discussion has focused on the role being played by PDBs — either national or subnational — within developing countries. By contrast, the significant role that multilateral development banks are playing in providing large amounts of investment and support for projects to mitigate climate change has been examined in considerable detail (Zenawi, Stoltenberg, et al. 2010). Some work has also been done on the role of public funding for low-carbon energy. This research has covered the activities of certain public sector schemes in both developed and developing countries (UNEP SEF Alliance, 2010).

The PDBs have a privileged position in their local markets, given their public nature, their strong knowledge of their countries' development needs, and opportunities and their vast experience in long-term investment financing. Within Southeast Asia and Europe, many — if not most — PDBs have embraced their responsibility to address climate change challenges and, to varying degrees, have contributed to supporting the structuring and financing of projects that enhance the environment and help reduce or avoid greenhouse gas (GHG) emissions within their countries. Latin America and the Caribbean, with its long tradition and experience with PDBs, is

now awakening to the potential of these institutions in supporting the financing of projects to mitigate climate change. As a result, many PDBs in the region are beginning to focus on this particularly challenging area of project finance. Furthermore, given the large amounts of long-term capital intermediated by PDBs in LAC, influencing the way in which these institutions think about climate change and approach low-carbon investments would very likely have a much greater impact on reducing GHG emissions than the reductions that result from the intermediation of all the international public funds for climate change combined.

The objective of this technical note is to spur the PDBs, and their government authorities, to action to catalyze the supply of and stimulate the demand for financing for investment projects to mitigate climate change within their respective countries. The note, which is directed to those PDBs that are interested in learning about what more can be done and want to take a more active role, discusses lessons learned from a number of PDBs in LAC based on in-person consultations by the authors. The note also discusses examples of best practices, processes and products in support of climate change mitigation from PDBs in Southeast Asia and Eastern Europe. While there is significant knowledge within the public domain about a number of the issues raised in this note, during the consultations it became clear that these issues need to be integrated from the perspective of PDBs so that these institutions in LAC can design relevant strategies to optimize their contributions. The note focuses on the potential of and highlights examples relating to energy efficiency, renewable energy and fuel substitutes. While it does not focus on other sectors with the potential to mitigate climate change, such as transport, waste management, forestry and agriculture, many of the conclusions and lessons drawn in this note could be applied to these sectors as well.

This note includes background related to the challenge of the dual objectives of reducing LAC's GHG emissions while meeting the energy needs of the region and discusses the role and purpose of PDBs. It elaborates on PDBs as key actors in mobilizing finance for climate change mitigation projects and their ability to influence other actors to stimulate greater investment in this area. It examines the main barriers and risks in financing renewable energy and energy efficiency projects and identifies potential measures and solutions to mitigate climate change. The note defines specific roles for PDBs to overcome these barriers, reflecting best practice examples from PDBs in LAC and around the world. Finally, the authors make recommendations and draw conclusions, providing a summary of the key factors that PDBs must take into account

to be an effective element of the framework for action against climate change, fulfill their role as a champion and help tackle the challenge of catalyzing financing for investment projects to mitigate climate change.

Background

Context

Climate change mitigation includes activities or actions to reduce GHG emissions by sources or to enhance the removal by sinks. Mitigation policies may include targets for reducing GHG emissions, increased use of renewable energy and increased energy efficiency. Climate change mitigation can include a diversity of measures that can reduce GHG emissions, such as switching to renewable energy (e.g., biomass, geothermal, hydro, solar or wind power), improving building insulation, using fossil fuels more efficiently, promoting waste treatment or enhancing carbon sinks such as forests.

Although LAC has historically emitted a relatively small percentage of the world's GHGs¹, the expected growth of its energy needs in coming decades and the potential for increased deterioration of its forest resources are likely to increase its contribution to global GHG emissions.² This increase will have adverse effects on LAC's ecosystems and social conditions.³ To stabilize the region's projected GHG emissions so that they remain at current levels in 2030, the capital investment needs for climate change mitigation are significant.

Current investments to mitigate climate change in LAC are massively short of what will be required to stabilize GHG emissions. The report by the Climate and Development Knowledge Network estimates that, by 2030, the LAC region will require an annual investment in mitigation of US\$40 billion to US\$80 billion and in adaptation of US\$18 billion to US\$21 billion.

¹ Latin America accounted for only 13 percent of global emissions in 2005, and its contribution to historic emissions is even lower. But its current emissions per capita are 10 tonnes of CO₂ equivalent (tCO₂e) per year, which is similar to the European average. The region has also contributed more than a quarter of the growth in emissions since 1990 (Fankhauser and Ward, 2010).

² Emissions from energy combustion increased at a rate of just under 3 percent per year between 1990 and 2005, which suggests that a greater focus on mitigating emissions will be required in the future. Energy emissions are more important within Central America and the Caribbean, where they account for two thirds of emissions (Fankhauser and Ward, 2010).

³ LAC is unique in having more emissions from land-use change than from energy sources. Agricultural emissions are also important, particularly in larger countries in South America. In Central America and the Caribbean, energy emissions (around 66 percent of total emissions) are much more important than those arising from land use and land use change (Fankhauser and Ward, 2010).

However, over the 2003–2010 period, cumulative mitigation and adaptation investments were only around US\$7.5 billion and US\$60 million, respectively (Fankhauser and Ward, 2010).

Investments in climate change mitigation, particularly in energy efficiency and renewable energy, are important not only to help reduce GHG emissions but also to significantly strengthen the productivity and competitiveness of many economies in LAC and hence their balance of payments position. Such is the case for countries in Central America and the Caribbean, which depend on thermoelectric power generation from costly imported fuels. These countries, with the right legal and regulatory frameworks, incentives structures and financial mechanisms, could benefit immensely from investments in energy efficiency (including grid reinforcement) as well as solar, wind and biomass power generation.

Given the large amount of investment in climate change mitigation that is required in LAC in coming decades, it is clear that public sector resources will not be enough to confront the challenge. Therefore, dedicated international financing, as well as local and foreign private sector investment, will be essential for low-carbon growth. It will be critical to emphasize public–private partnerships to achieve transformational investments, especially to reduce energy and industrial GHG emissions, diminish deforestation rates and enhance sinks through land-use change.

In public–private partnerships, the public sector plays a very important role in mobilizing and leveraging commercial financing for private sector investment projects in climate change mitigation. According a recent report (Maclean et al., 2008), “it is estimated that if a concerted program of public finance mechanisms were scaled up, US\$10 billion in public monies could leverage US\$50 billion to US\$150 billion in total investment in the climate mitigation sectors” (i.e., leverage ratios that range from 3 to 15:1). The leveraging effects are clear and some of the most effective vehicles for that leverage to be realized and optimized are PDBs. In many countries inside and outside LAC, PDBs are the main investment financing arms not only of their respective governments but also of their local financial markets.

Public Development Banks

Public development banks were set up by governments as specialized financial institutions to provide long-term financing to sectors that promote a country’s economic development and growth. The rationale for PDBs is to achieve public policy objectives by responding to perceived

gaps in the availability of financial services for projects or sectors of the economy that are underserved by private sector sources of financing. As such, PDBs have an important role to play in a country's financial system (Smallridge and de Olloqui, 2011).

The above market deficiencies would be considered supply-side gaps; there can also be demand-side gaps. In some instances, a PDB can play a role in developing a particular sector or market by providing resources such as technical assistance and training to project developers and small and medium-sized enterprises (SMEs), among others, to create demand for financing. A PDB can also help develop and structure projects.

Public development banks are generally funded directly by the government, by accessing the bond market and/or by loans from multilateral or regional financial institutions. The banks can operate as either Tier 1 institutions (i.e., institutions that deliver financial services directly to their clientele, whether an individual, corporation or project) or Tier 2 institutions (i.e., institutions that channel financial resources to their clientele through commercial banks or other financial intermediaries).

In climate change mitigation, the role of PDBs in catalyzing the supply of financial resources from private, government and multilateral sources and stimulating the demand for such financing has been discussed in a variety of forums (Peralta, 2007). However, there has yet to be published information about the activities of these institutions in promoting the financing of climate change mitigation. The focus to date has largely been on the trend toward PDBs "greening" their own businesses by applying environmental and social standards to the products that they support. As Peralta states in respect of the Association of Development Financing Institutions of Asia-Pacific (ADFIAP), its members learn to "manage environmental risks and observe environmental standards when they lend money." He then goes on to state that only after PDBs have learned to apply such standards to their own operations can they look to developing products and instruments that will help motivate and support the development of investments for climate change mitigation. "Some ADFIAP members even go beyond environmental governance. They themselves are directly engaged in innovative programs and become environmental 'champions' in their countries" (Peralta, 2007).

In this context, why are PDBs critical to financing projects to mitigate climate change?

1. Public Development Banks have a **public policy mandate** to promote financing and associated market development in priority underserved sectors. Their governments mandate that they operate within the financial sector to ensure that these priority underserved market needs are being addressed appropriately.
2. It is typically **not in the nature of PDBs to compete**; rather, governments expect them to complement private financial intermediaries and engage and catalyze the private sector by providing appropriate financial instruments. In addition, as part of the community of development banks in LAC and globally, the PDBs have opportunities to share lessons learned and disseminate best practices.
3. Since PDBs are **part of the public sector**, they can interact with different levels of government. They can administer non-reimbursable budgetary resources granted by public sector agencies to support national or subnational priority programs, including investment projects to mitigate climate change that are promoted by private sector actors. Moreover, because of their interactions with the financial and non-financial private sectors, PDBs can influence policy directly by informing policymakers about impacts and implementation of various policy options.
4. These banks are in the **business of financing and risk taking**, particularly in support of long-term investments. Indeed, PDBs are — first and foremost — financial institutions, often under the same bank supervision rules in their countries as commercial banks.
5. They have **long-standing relationships with private sector financial institutions** and hence understand the risks and barriers that these institutions confront when financing underserved sectors such as climate change mitigation. In fact, they are in a better position to understand such risks and barriers than any other entity within the public sector.
6. In those cases where a PDB can operate as a Tier 1 institution, PDBs understand the **risks and barriers that long-term project promoters confront** in the structuring and financing of investment projects and can assume the risks that the local financial institutions (LFIs) are unable to assume.
7. These banks can also **influence the structure of a project by stipulating lending criteria for better, cleaner technologies** and financing the incremental costs associated

with such technologies, often at a concessional rate of interest. In this way, PDBs recognize and provide financing in order to avoid the negative externalities associated with a conventional solution.

8. They can **aggregate small-scale projects** by adopting a portfolio approach when assessing credit risk and streamlining the application process to minimize transaction costs, thus encouraging LFIs to participate.
9. They can **develop and incubate innovative and catalytic financial instruments** for climate-friendly projects and demonstrate to the private financial sector the potential profitability within these areas.
10. Public development banks have access to **long-term sources of local and international finance, and to non-reimbursable resources for development purposes**. In a number of countries, PDBs are the main financier with access not only to long-term hard currency borrowings at relatively favorable rates and conditions for the financing of long-term investment projects, but also to grants and non-reimbursable technical assistance resources. The multilateral development banks, bilateral development finance institutions and foreign export credit agencies use PDBs as financial intermediaries for long-term hard currency loans and to allocate and disburse development grants. It is worth noting that, through non-reimbursable resources obtained from their own governments and international donors, PDBs have been able to support the technical and financial structuring of investment projects to mitigate climate change, as well as the training and capacity building of LFIs, project promoters and beneficiary firms.
11. Finally, and most importantly, PDBs can connect **all of the relevant public and private sector actors** that need to be involved in financing projects to mitigate climate change.

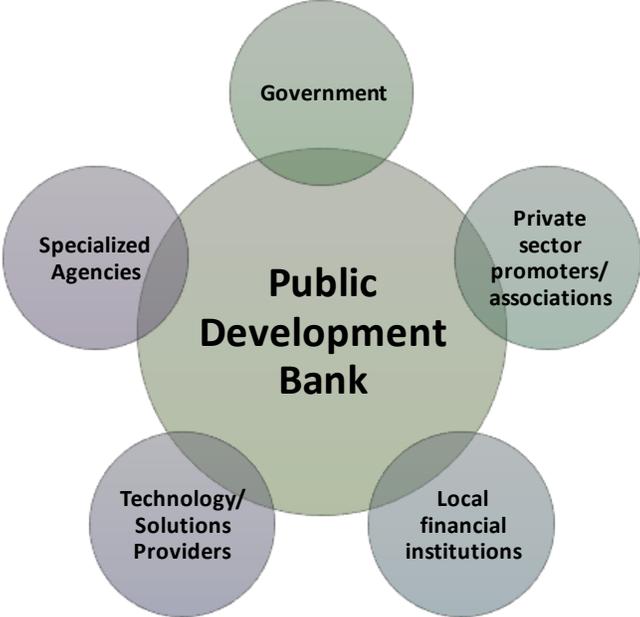
In summary, PDBs have the natural capacity and competencies to play a leadership role in financing investment projects to mitigate climate change. These banks can innovate and are in a position to create a coalition of financiers with the proper backing of their respective governments to generate the necessary conditions for project development.

Role of PDBs in Financing Climate Change Mitigation

In climate change mitigation, there are a variety of national agencies that need to come together and align toward a common goal. One of the biggest barriers is the language, level and process of communication between these agencies. Some speak the language of energy (KWh), others the language of money (return on capital) and some the language of policy (reducing GHG emissions). Some of these organizations operate at the strategic and policy levels, while others focus on transactions. Some need to participate at the outset of the country’s climate change strategy, while others are only engaged once the policy framework is established. Public development banks are in a unique position to act as interpreter for and to interface with the various entities to ensure interests are aligned. These banks have the credibility and connections with the various stakeholders within government and the private sector, such as other financial institutions and project developers, among others.

The role of PDBs in promoting, supporting and financing projects to mitigate climate change is reflected in experiences in other regions of the world. In each transaction, the various entities relate to the PDB differently and the role of the PDB can change. Thus, a PDB could interact as a clearinghouse of information, technical support or financial support, and each relationship is a two-way street.

Figure 1: Relationship of PDB to Other Agencies in Financing Climate Change Mitigation Projects



Public development banks also have a central role to play with international agencies, such as international public finance funds for climate change, multilateral development banks and bilateral development agencies, which often use PDBs as financial intermediaries for their lending and grant programs. Furthermore, PDBs have to access international public finance funds for climate change, such as the Climate Investment Funds or the Global Environment Facility (GEF), through a multilateral development bank.

Government

Crucial to implementing successful projects to mitigate climate change is a conducive environment for private sector investment in general. One of the most important roles for the government — at both the national and local levels — is to ensure that projects can operate in a stable environment. The government must establish the policy framework that supports investments in climate change mitigation, including the necessary regulatory and incentive frameworks that provide clear and long-term market signals, such as a price for carbon.

A public policy framework that relates more specifically to projects for climate change mitigation can cover a range of areas, including, among others (IPCC, 2007):

- Development policies that integrate climate policies in order to aid implementation and overcome barriers
- Regulations and standards, such as setting targets for the future energy mix by implementing a Renewable Portfolio Standard
- Taxes and charges, including the elimination of perverse subsidies that distort prices and discourage investments in climate-friendly technologies
- Tradable emissions credits
- Financial incentives, such as tax credits and subsidies to improve the attractiveness of more energy efficient and renewable energy technologies, including more favorable feed-in tariffs for renewable energy
- Climate-friendly public procurement
- Voluntary agreements between governments and industry
- Support for research, development and demonstration of climate-friendly technology

Through their policy frameworks, governments set out clear mandates for PDBs to support investment projects to mitigate climate change and to facilitate the involvement of LFIIs.

Additionally, governments can assign adequate budgetary and/or other non-reimbursable resources to develop the supply of and demand for financing for climate change projects and to support the development of relevant market actors. Governments also provide resources in their budgets to orchestrate campaigns to raise awareness not only of the potential to reduce GHG emissions, but also energy efficiency, fuel switching, renewable energy and phasing out carbon-intensive technology, among other possibilities for change.

In turn, PDBs provide their governments input with respect to the adequacy of the regulatory and incentive frameworks as well as periodic assessments of the main bottlenecks and barriers faced by project developers in implementing projects for climate change mitigation.

Private Sector Promoters and Developers, and Associations

Some of the reasons that a project developer would be motivated to undertake a venture in energy efficiency or renewable energy would be opportunity, competitiveness, cost savings or possible future changes in regulations at the national or international levels. An entrepreneur cannot be expected to undertake such an investment simply because of concerns about climate change; economic benefits must accrue from the investment itself or from potential additional revenue associated with reductions in carbon emissions.

The relationships between PDBs and private sector promoters and related associations of promoters cover a variety of activities. Apart from undertaking awareness campaigns regarding opportunities and challenges associated with investment projects for climate change mitigation, PDBs should provide information about appropriate financing strategies, relevant market actors, major risks and barriers, and availability of support. Collaborating with industrial associations (e.g., the manufacturing, agriculture, construction or the hotel industry), PDBs, in close consultation with financial institutions, could design a strategy to identify, promote and finance potential investments in sectors where there is a critical mass of business that justifies making a targeted effort. Needless to say that consultation with LFIs to identify risks and barriers is required prior to rolling out any communication and awareness campaigns with project proponents.

Public development banks can also provide technical assistance and training. With respect to specific transactions, PDBs provide support in structuring bankable projects and in designing and implementing appropriate financing strategies and financial instruments.

Private sector promoters present PDBs with project concepts and financial needs, and give PDBs feedback about major constraints that face promoters in developing investment projects for climate change mitigation.

Technology and Solutions Providers

Technology and engineering companies — whether international or national — face challenges in adapting their technologies to local conditions. Often the technology is new, with a limited track record in the country, or it has not been used within the particular market and end-users are not knowledgeable about what the technology can do or whether it is reliable.

Service providers such as engineering companies may not recognize the opportunity or be in a position to transform their business model into a services company model (such as energy services companies [ESCOs], discussed below). In these cases, PDBs have an important role in building awareness and catalyzing support to promote this transformation and development.

Local Financial Institutions

Locally owned or international financial institutions with a local presence are key stakeholders for PDBs because they are often delivery channels for the PDBs' financial support (whether as Tier 2 lenders to LFIs or in providing guarantees). Public development banks must work diligently to understand the needs and motivations of LFIs regarding the substitution of conventional, well understood technologies with new, less well understood, climate-friendly technologies. Specifically, PDBs should try to understand why LFIs are not getting into the business of financing projects to mitigate climate change, what specific barriers and risks they confront in financing such projects and what it would take for them to become engaged in this type of long-term investment financing.

To achieve this end, PDBs can embark on awareness campaigns to promote projects for climate change mitigation by providing information and training about the risks and barriers associated with alternative technologies as well as relevant market actors and opportunities in particular sub-sectors. Working with the LFIs, PDBs can help develop financial strategies, including appropriate financial instruments and technical assistance and training for project promoters, to take advantage of existing opportunities and to support the financing of specific large-scale investment projects for climate change mitigation by leading the structuring of those projects or providing co-financing.

Specialized Agencies

Within the government, or as non-governmental organizations (in some countries, for example, the national cleaner production centers), there are agencies whose mandate is to create the right conditions for private sector investment. These agencies help structure and implement projects and provide for adequate monitoring and evaluation. They are typically associated with the ministry of environment or energy.

The role of these agencies is to identify particular sub-sectors where there is real potential to introduce commercially viable new technologies to mitigate climate change and analyze appropriate technologies and major resource and/or implementation risks in the country. In many countries, and in particular for technologies that are not yet fully commercial, a key role of such specialized agencies may be to identify and, most importantly, certify technology and solutions providers. As part of the certification process, specialized agencies analyze the quality and reliability of warranties and post-sale capabilities.

The relationship of PDBs to these specialized agencies is very important. From the view of PDBs, a good specialized agency ensures the quality of technologies and provides performance guarantees that reduce technology and, ultimately, credit risk. These agencies can also play a critical role in assessing potential reductions in GHG emissions, opening new business opportunities for PDBs, and in supporting the monitoring, reporting and verification (MRV) of reductions in GHG emissions achieved by project promoters and developers. By virtue of their role in providing financial services in support of these projects, PDBs can provide ongoing assessment and feedback regarding the main bottlenecks and barriers faced by the market in implementing investment projects for climate change mitigation. Further, PDBs can provide feedback about the performance of technology solution providers. In addition, PDBs can provide feedback about the training and technical assistance needs of private sector promoters, associations, and technology and solution providers.

Barriers, Risks and Solutions

Given the amount of investment required in LAC to address climate change mitigation, it is important to identify and define the main barriers and risks that discourage investments in mitigation projects (e.g., renewable energy and energy efficiency) before examining how these barriers can be addressed and, more specifically, what PDBs can do to help.

Considering the roles of government, the private sector, technology and solutions providers, LFIs and specialized agencies, the barriers that they each confront will limit investments in projects to mitigate climate change unless such barriers are tackled. Public development banks play a vital role in identifying known and potential risks and barriers. Supply-side challenges are related to getting financing for projects; demand-side challenges are related to getting developers interested in structuring and implementing projects.

On the supply side, lack of financing on appropriate terms and conditions from LFIs is clearly an important factor. “This lack of access [to finance] is caused by a ‘disconnect’ between the traditional lending practices of LFIs and the financing needs of energy efficiency projects. LFIs typically apply their traditional ‘asset-based’ corporate lending approach for energy efficiency projects that is limited to their lending a maximum of 70 to 80 percent of the value of assets financed (or collateral provided). Unfortunately, there is often little or no collateral value in the energy efficiency equipment once installed in a facility; rather, the value is the cash flow generated from the equipment after installation” (Efficiency Valuation Organization, 2009). The same is true for renewable energy projects. There is a lack of access to finance for both greenfield renewable energy projects and for additional investment in existing facilities to meet energy requirements through renewable energy sources. There is also little financing available for small-scale renewable energy equipment for households (e.g., solar systems and water heaters). This shortage of financing is due primarily to a lack of familiarity with the technology, which makes LFIs reluctant to take the risks.

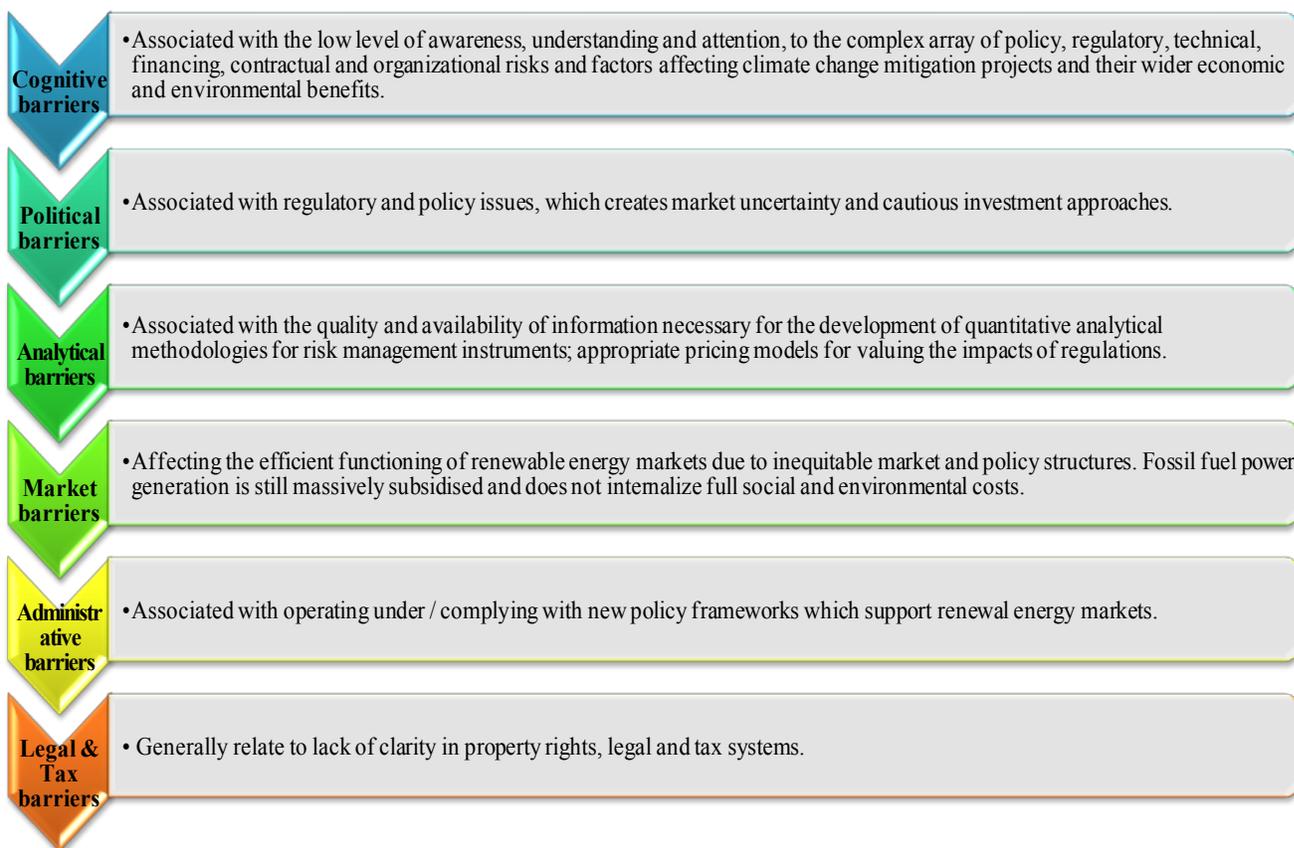
On the demand side, project proponents are often unaware of opportunities, do not understand the economic benefits or have trouble identifying project partners. As a result, they may not be able to structure a bankable project to present to an LFI. For renewable energy projects, it may be that the technology is unfamiliar. For energy efficiency projects, the project proponent or end-user must bear the cost of completing an energy audit to establish a baseline against which to measure energy savings. The end-user may not understand or have confidence

that sufficient energy savings can be realized to cover the cost of the audit and the cost of any energy savings measures that might need to be implemented. In all cases, project proponents often confront serious limitations in financing the project development cycle, which spans from conceptualization through feasibility studies to preparation for financing.

Barriers

For the purposes of this note, barriers are defined as information not getting to the right people at the right time. Barriers are associated with the main stakeholders — government, project proponents, financiers — not having access to the quality and quantity of data required to make informed decisions, and policies that are not conducive to financing projects. Perhaps the most significant barrier is the lack of awareness of and understanding about climate change issues and associated opportunities, which is described in Figure 2 as a “cognitive” barrier.

Figure 2: Main Barriers for Energy Projects to Mitigate Climate Change



Source: Adapted from UNEP-SEFI

Risks

The risks associated with investment projects to mitigate climate change include not only traditional project finance risks, but further risks specific to this type of project. It is useful to consider renewable energy projects and energy efficiency projects separately.

Figure 3 depicts the risks facing a wind project for which repayment of the loan does not rely on a corporate balance sheet, but rather on the project's cash flow.

Figure 3: Risks for a Wind Project



Source: Adapted from UNEP-SEFI and Money Matters

The traditional risks, such as credit risk of the project sponsor and revenue risk associated with the creditworthiness of the off-taker/customer and the quality of the power purchase agreement, are familiar to project financiers, but there are new risks associated with new technologies. New technologies may be more expensive than traditional technologies and may not have a lengthy track record of proven performance or a reliable after-sales warranty from the manufacturer. Or, they may be proven technologies that have to be adapted to and become known within the local market. In the case of wind and other renewable sources of energy, there is the risk associated with the intermittency of the supply of power (i.e., resource risk in the event the estimates of wind are higher than those realized).

While traditional projects face the usual risks associated with the regulatory framework, there are additional risks for the renewable energy sector. For example, the government may have in place enticements to encourage a switch to alternative energy, such as a more favorable feed-in tariff scheme or tax/financial incentives to make capital investments in renewable energy technologies. However, these schemes may change, which would have an impact on the project's long-term financial viability.

Moreover, if the project is seeking to generate carbon credits (for instance, under the Clean Development Mechanism [CDM] of the Kyoto Protocol), there are additional international regulatory risks (see Annex B for more details) associated with the process of registering the project with the CDM Executive Board. Indeed, delays in registering the project can be a problem if the project relies on carbon credits as a source of revenue by monetizing the Emissions Reduction Purchase Agreement (ERPA) or as collateral against which financiers lend.

For energy efficiency projects, the key issue is whether energy savings will materialize. To determine the expected amount of energy savings, project proponents require an energy audit of their industrial or commercial operations by a professionally certified technical specialist. Such an audit is often conducted by an ESCO.

An ESCO is a business that develops, engineers and installs energy efficiency projects in a variety of end-user sectors. These companies enter into an Energy Savings Partnership with the energy end-user in which the ESCO packages a complete turnkey offering, including comprehensive engineering design, installation, monitoring and commissioning, to bring about energy savings. Energy services companies often provide or arrange financing for projects, but since they are not themselves a source of financing, they also require financing — often both debt and equity — from commercial financial institutions. Box 1 describes the two main ESCO models. Needless is to say, ESCOs having limited access to financing and technical assistance can be an important barrier to energy efficiency projects.

Box 1: ESCO Models

Shared Savings

The ESCO provides all upfront capital needed for turnkey development and installation of the Energy Savings Partnership. The energy end-user is only responsible for repaying a defined share of the savings that they realize from the Energy Savings Partnership. The ESCO assumes the credit risk and all project performance risk.

Guaranteed Savings

The end-user enters into a separate loan or lease with a full obligation to repay the LFI. This obligation is backed by an energy savings guarantee agreement with the ESCO. The savings guarantee demonstrates that the savings from the Energy Savings Partnership will generate sufficient cash flow for the end-user to make the term payments for the loan or lease.

Source: Hansen with Langlois and Bertoldi (2009)

The main risks facing energy efficiency projects relate to the ability of the technology to deliver savings and the financial strength of the ESCO or end-user borrowing the money for the capital investment. There are also contract risks when either the ESCO or the end-user does not adhere to their contractual responsibilities, such as in situations where the energy audit is performed by another entity than the ESCO implementing the energy savings project, creating a baseline to measure the savings that the ESCO does not accept.

In the shared savings model, the ESCO capitalizes the investment in the energy efficiency technology and so the risks facing an LFI are on the ESCO's balance sheet as a corporate financing. Shared savings is the model used primarily in developing markets so that end-users do not assume the performance risk. Only larger ESCOs with balance sheets that can invest directly or have access to loans from LFIs can participate in this market, which naturally hampers long-term growth and competition within the ESCO industry.

Since the ESCO is the borrower in the shared savings model, the LFI's due diligence requirements are greatly increased and resemble a limited-recourse project financing. Considerations include not only the end-user credit risk, but also project economics, project engineering and technical performance, ESCO financials and equity contribution, and all relevant project contracts, including the Energy Service Agreement. This model can be extended to finance multiple projects for the same ESCO, in which a lender can finance a series of projects pursuant to a multi-project loan facility.

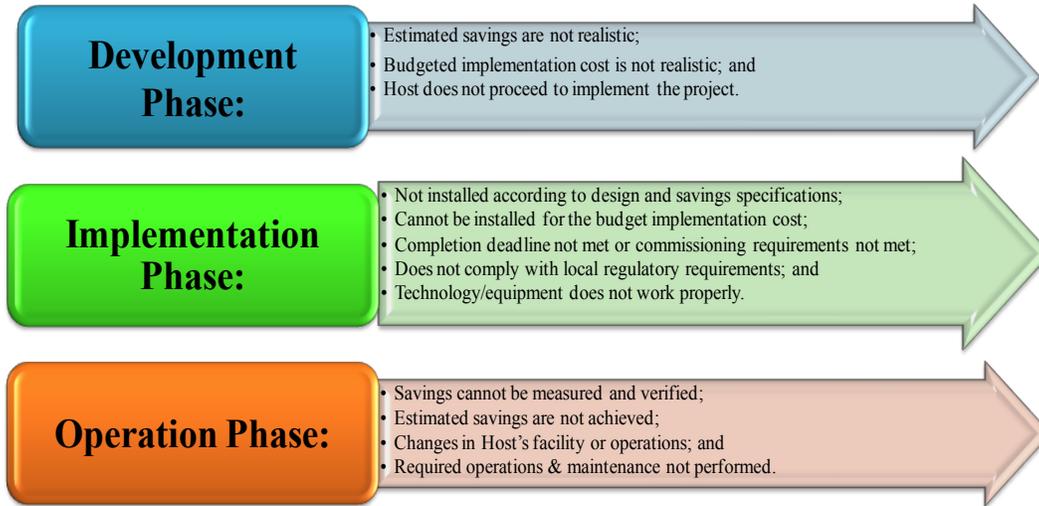
In the guaranteed savings model, the financing is undertaken by the end-user. The LFI therefore provides corporate finance for the end-user, which thus assumes the repayment responsibilities. This structure tends to be more common in mature markets where the concept of ESCOs is understood by industrial and commercial customers. Further, this structure encourages smaller ESCOs, whose balance sheets are more limited, to participate.

For the guaranteed savings model, the financing involves two agreements: one for the project installation between the end-user and the contractor (usually an ESCO) and one for the financing between the end-user and the financial institution for the loan. In this case, all end-user credit risks are borne by the financial institution, and all technical and performance risks are addressed between the contractor/ESCO and the end-user.

For energy savings projects, whether structured on a shared savings or guaranteed savings model, performance risks typically can be classified in relation to the three major phases

of the project: development, implementation and operation. The major risks during each of these phases are shown in Figure 4.

Figure 4: Performance Risks of Energy Efficiency Projects



Source: Hansen with Langlois and Bertoldi (2009).

Measures and Solutions to Mitigate Risks and Overcome Barriers

Some of the barriers and risks discussed above affect project proponents and some affect financiers. This section discusses potential measures and solutions to overcome these obstacles.

Too often problems are identified and good solutions are developed to address the problems but, because of a lack of thorough analysis, these solutions end up solving the wrong problems. It is therefore vital to understand why the obstacles exist, what conditions are necessary to overcome these obstacles, and whether the measures or solutions will work to overcome them.

Certainly, a track record of implementing successful projects is perhaps the most powerful tool to eliminating barriers and addressing risks. A project developer who has previously undertaken similar projects will be more willing to undertake new ones, and the LFI more willing to finance them. An ESCO that has designed and operated a successful energy savings structure will be more inclined to undertake a larger, perhaps riskier, project, and an LFI may be more willing to back that ESCO. Simply put, success breeds success. A key challenge is successfully implementing a first project to demonstrate viability to all relevant parties.

Market gaps can take many forms and the reasons for them are varied. Further, market gaps are not static; they change over time and require regular review and testing. Prior to designing solutions, it is crucial to understand in detail what the specific issues the LFIs face in order for them to engage in these types of projects. This analysis must be aimed at assessing not only where the market gaps are, but why they exist and whether and how they can be addressed.

There are many examples of market gaps and of PDBs introducing financial schemes to address a particular gap without necessarily having a clear understanding of the gap they intend to address. It could be that the LFI is uncomfortable with the counterparty risk or that the transaction is too small relative to the transaction costs. Or, it could be that the LFI is unfamiliar with a certain technology. It may be a supply-side or a demand-side gap. The challenges may also be due to the investing environment or to particular project factors. There are myriad reasons for market gaps. Careful analysis is required to identify not only the nature of the gap but, more importantly, its root cause.

Table 1: Illustrative List of Obstacles and Possible Solutions

	If an Obstacle is....	Then a possible solution is.....
Enabling Challenges	Lack of awareness of opportunities for climate change mitigation and economic benefits	Capacity building and awareness campaigns need to be provided to project developers and LFIs, building on key success stories
	Lack of coordination among main actors	Policymakers, LFIs and project developers need to be assembled to generate action and synchronize objectives and interests
	Lack of knowledge of relevant market actors, including LFIs, technology and service providers	Technology and service providers need to be certified and promoted to project developers and LFIs
Project Challenges	Costs of feasibility studies and project preparation are prohibitive	Project proponents need support and incentives to pursue opportunities
	Knowledge of sector or technology is lacking	LFI may need to co-finance with another local or foreign lender with prior experience in the area
	Counterparty risk is too high or lacks sufficient collateral	LFI may need a guarantee from a third party
	Project lacks sufficient equity	Project proponents need additional equity to strengthen the balance sheet of the underlying project
	Transaction size too small or transaction costs too high relative to return for the LFI	LFI may need to bundle a package of projects to achieve economies of scale
	Long-term liquidity not available to LFI	LFI may need to access long-term funds — in foreign or local currency — to meet project requirements

If an Obstacle is....	Then a possible solution is.....
Transaction size too large for LFI's balance sheet	LFI may need to syndicate transaction
Credit risk limits reached for obligor or sector	LFI may need to transfer risk to a third party to stay within its obligor or sector limits
CDM process is not well understood or easy to manage	Project developer may need guidance and financial support to navigate the process
Proper monitoring, reporting and verifying of reductions in GHG emissions	Project developers and LFIs may need guidance and technical support to establish an adequate MRV system or financial incentives through performance-based financing

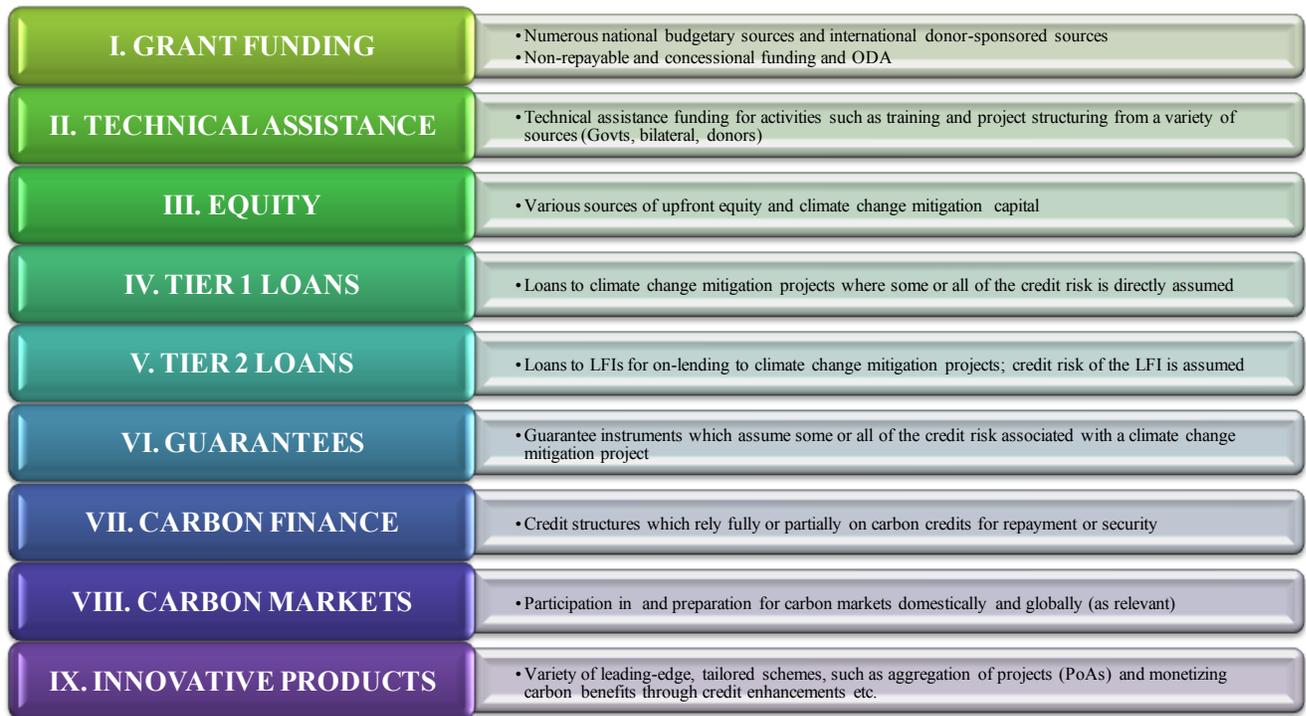
Role of PDBs in Promoting Investments

Public development banks have the capacity, mandate and instruments to stimulate demand for and catalyze the supply of financing for projects to mitigate climate change. As such, they have a vital part to play in working with both sides of the financing — the lender and the borrower — in promoting greater investment in mitigation projects. Working with private sector sources of financing, PDBs can provide financial instruments that facilitate the involvement of LFIs, ultimately leading to further growth in private financing resources.

In addition, PDBs have an equally valid role in stimulating demand for financial services by addressing non-financial gaps through training and advisory services for SMEs and ESCOs. Also, PDBs can work with developers to structure renewable energy projects such that they are not only bankable, but also accountable in terms of reductions in GHG emissions. There are many ways PDBs can stimulate demand through education, technical support and awareness.

Public development banks offer a range of financing mechanisms and tools that can include any combination of grant, equity, guarantee or lending program, product or service. Offerings can include both early-stage support services and later-stage products, such as those designed to monetize carbon credits, to support projects for climate change mitigation. Given the diverse range of financial services and products, it is helpful to categorize the various activities of PDBs, as summarized in Figure 5 and discussed in detail below. Note that not all PDBs offer all products, and some PDBs are restricted either by law or by policy. For example, many PDBs in Latin America can only provide Tier 2 lending through an LFI.

Figure 5: PDB Financing Mechanisms



**(i) Dedicated international public funding
(grants and highly concessional lending to address climate change)**

There are many sources of grants and highly concessional funding for projects and activities to mitigate climate change that are offered internationally and by national governments (see Annex A). Indeed, a number of multilateral and bilateral funds have been established to support activities that address climate change, offering both grants and highly concessional lending.

The GEF, which was established in 1991 and acts as the financing mechanism of the United Nations Climate Change Convention, provides grants and concessional funding, and has been the largest single funder of projects to improve the environment, having allocated over US\$9.2 billion to date. The relatively new Climate Investment Funds (multilateral funds dedicated to climate change) have resources that exceed US\$6 billion. The Climate Investment Funds comprise the Clean Technology Fund and the Strategic Climate Fund. There are also many World Bank and other multilateral and bilateral funds dedicated to similar purposes, as well as concessional and official development assistance funds.

At the national level, governments in LAC have been making grants available for use as first loss reserves for guarantee programs or as subsidies to bring down the capital costs of projects that involve new technologies or transaction costs associated with enhanced due diligence requirements.

(ii) Technical Assistance

Technical assistance programs are grant based and to be used for specific advice (e.g., feasibility studies or advice on CDM processes). The universe of donors for grants and technical assistance are generally the same (see Annex A). The difference between grants and technical assistance is that technical assistance funds are intended for advisory services, whereas grants can be used directly for the project, like equity funds. As stated earlier in this note, technical assistance to support critical activities of the project development cycle is one of the most pressing issues for effective promotion of investment projects for climate change mitigation (Aequero, 2010). More aggressive incentives from international organizations and the public sector are particularly important going forward.

(iii) Equity

A critically underserved area of financing for climate change mitigation is access to long-term investment capital at an early stage of a project. A number of PDBs invest in technology companies or funds directly or through their venture capital arms.

(iv) Tier 1 Loans

These loans are provided directly to mitigation projects with some or all of the credit risk assumed by the PDB. If PDBs gain access to long-term, highly concessional sources of international financing for projects to mitigate climate change, these resources can be blended with multilateral and bilateral funding, and the PDB's own resources, to provide better terms and conditions to project developers.

(v) Tier 2 Loans

These are loans by PDBs to LFI — typically commercial banks — for on-lending to projects for climate change mitigation. The PDB takes on the LFI's credit risk and the LFI assumes the project credit risk. As in Tier 1 loans, PDBs can blend their own resources with highly concessional funding from international sources of public financing

and multilateral and bilateral institutions to improve the terms and conditions of their funding to LFIs. In turn, LFIs can offer better terms and conditions to project developers.

(vi) Guarantees

Guarantees and related contingent liability instruments assume some or all of the credit risk associated with a green project obligor's repayment obligations. Typically, such guarantees involve a PDB providing enhanced credit to an LFI or other third party financial intermediary that is providing direct funding or other investment.

(vii) Carbon Finance

An underlying carbon credit that is generated by the project can be traded and the proceeds used in the financing structure. Essentially, this mechanism relies on the sale of future carbon credits by way of an ERPA. The kinds of carbon credit assets that can be traded are broad and varied, and include both offsets and allowances.

Carbon finance transactions can occur privately or through a number of national, regional and international exchanges, the largest of which is the European Commission's EU Emissions Trading System (EU ETS). Based on pay-on-delivery transactions, carbon credits are traded only once the reductions in GHG emissions are generated and certified. Hence, project developers have to wait for GHG emissions to decline for these funds to be generated, and therefore these funds cannot be used for project implementation.

Some entities can provide upfront financing within the ERPA contracts and others can provide a degree of standalone ERPA-backed financing. By providing such financing, these entities are assuming the risk that credits will not be delivered by project developers. In exchange, project developers are generally paid a lower price for the carbon credits. Of note, neither of these upfront methods of monetization is as yet very widely used because of the inherent risks related to delivery of reductions in carbon emissions.

(viii) Carbon Markets

Participation in carbon markets implies a secondary (rather than primary as in carbon finance) dealing with underlying carbon assets. Demand and supply considerations are important. An entity may be able to access its own domestic carbon markets, or international markets, depending on the kinds of carbon credits created and relevant

eligibility criteria. Preparatory measures for participation in carbon markets, and marketing support for clients needing access to carbon markets, are relevant activities.

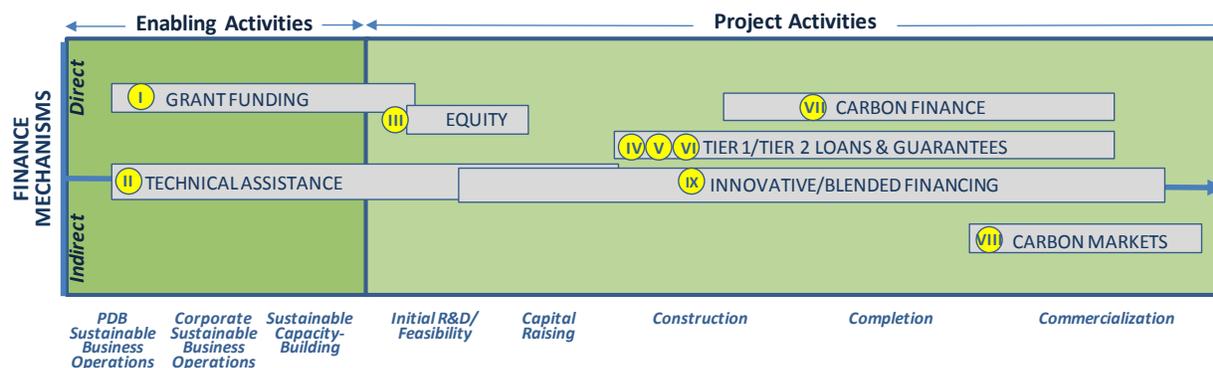
(ix) Innovative Financing Products

There are novel uses of financing capacity to fill gaps and structure solutions in unique areas of green finance. For example, there are institutions that provide blended support (e.g., a combination of grants, technical assistance and carbon credit financing). The most innovative financial institutions are finding ways to address the gap between the underlying investment and when the carbon revenues are monetized. Typically, payment of carbon credits only occurs “on delivery”. This means that project sponsors have to wait until the project is at a very advanced stage before any revenue comes from carbon credits. However, project developers need access to these funds much earlier to get their projects off the ground. The reason for this gap is that carbon financiers have trouble accepting the “delivery risk” of carbon credits.

To address this gap, there have been attempts to use insurance product “wraps” to cover some or all of the country and/or regulatory risks associated with carbon credits. There have also been “partial delivery guarantees” aimed at guaranteeing the project risk. Finally, there are institutions that are considering standalone ERPA-backed financing. None of these methods are well deployed at this time, but approaches are evolving. For example, development banks KfW and NEFCO (Nordic Environment Finance Corporation) acquired 4.6 million carbon credits from two CDM wind farm projects in Mexico that were developed by Eolia Renovables and Banco Santander. The main source of repayment to Banco Santander was the carbon credit payments from the ERPA, which were fronted by KfW and NEFCO (NEFCO, 2011).

Figure 6 relates the institutional framework to the various PDB financing mechanisms. Moreover, it captures these dimensions within the context of how projects generally develop, beginning with earlier-stage enabling activities and transitioning to later-stage project activities.

Figure 6: PDB’s Institutional Framework for Climate Change Mitigation Activities



Before PDBs can credibly work to foster awareness of financing green projects in its stakeholders and clients, they must “green” their own operations. This may mean building awareness and training internally, and introducing environmental impact assessments for all project funding. In fact, official development assistance funds from bilateral and multilateral sources usually require PDBs to institute environmental and social governance requirements.

It is important that PDBs invest in their own environmental management systems, which can set the stage for demonstrating credentials and expertise in environmental and climate change considerations. These investments can be made in parallel with the ultimate goal of supporting market development in climate change mitigation.

Public development banks can use a number of financing mechanisms to support projects — from initial technology research and development and project feasibility studies, through early-stage capital and project launch, to construction, completion and commercialization (potentially even international dissemination) of technologies and projects.

Financing mechanisms can relate to various stages of activity; however, certain mechanisms, such as grants and technical assistance, tend to arise more often in the enabling phase and other financing mechanisms tend to be related to project activities. Finally, certain mechanisms are more direct in their impact on project outcomes (such as grant monies and green capital), while others are less direct (such as carbon markets).

Best Practices

For this note, the authors researched activities related to climate change mitigation that were accomplished by PDBs throughout the world, particularly in Latin America. In-country consultations with PDBs, LFIs and a number of other stakeholders took place in Mexico, Peru,

Chile and Brazil. This research identified best practices to address the main barriers and risks faced by project developers and LFIs in considering investments in projects to mitigate climate change.

Table 2 identifies obstacles and proposes possible solutions. It then considers best practices case studies of various targeted interventions undertaken by PDBs. In each case (summarized following the table), the PDB sought to understand the nature and dimension of the problem it needed to solve and successfully designed and implemented a facility that addressed the market gap. In the fieldwork, researchers also identified cases where proper analysis of the gaps was not conducted and the instruments that were designed did not have the intended effects because they did not fully address the underlying problem. Indeed, in several cases, even though PDBs had designed and implemented dedicated financing lines for climate change mitigation projects, loans from those lines were not being demanded by project promoters because the latter were not able to structure bankable climate change mitigation projects.

Table 2: Examples of Best Practices for PDBs

	If an Obstacle is....	Then a possible solution is.....	Best Practice Example
Enabling Challenges	Lack of awareness of opportunities for climate change mitigation and economic benefits	Capacity building and awareness campaigns need to be provided to project developers and LFIs, building on key success stories	Case Study #1: CORFO, Chile
	Lack of coordination among main actors	Policymakers, LFIs and project developers need to be assembled to generate action and synchronize objectives and interests	Case Study #2: SHF, Mexico
	Lack of knowledge of relevant market actors, including LFIs, technology and service providers	Technology and service providers need to be certified and promoted to project developers and LFIs	Case Study #3: FIRA, Mexico
Project Challenges	Costs of feasibility studies and project preparation are prohibitive	Project proponents need support and incentives to pursue opportunities	Case Study #4,5: Development Bank of the Philippines; NAFIN, Mexico
	Knowledge of sector or technology is lacking	LFI may need to co-finance with another local or foreign lender with prior experience in the area	
	Counterparty risk is too high or lacks sufficient collateral	LFI may need a guarantee from a third party	Case Study #6: BNDES, Brazil
	Project lacks sufficient equity	Project proponents need additional equity to strengthen the balance sheet of the underlying project	Case Study #7: FIRA, Mexico
	Transaction size too small or transaction costs too high	LFI may need to bundle a package of projects to achieve economies of scale	Case Study #8: Bancóldex, Colombia

If an Obstacle is....	Then a possible solution is.....	Best Practice Example
relative to return for the LFI		
Long-term liquidity not available to LFI	LFI may need to access long-term funds — in foreign or local currency — to meet project requirements	Case Study #9: COFIDE, Peru
Transaction size too large for LFI's balance sheet	LFI may need to syndicate transaction	Case Study #10: HBOR, Croatia
Credit risk limits reached for obligor or sector	LFI may need to transfer risk to a third party to stay within its obligor or sector limits	Case Study #11: BNDES, Brazil
CDM process is not well understood or easy to manage	Project developer may need guidance and financial support to navigate the process	Case Study #12: COFIDE, Peru
Proper monitoring, reporting and verifying of reductions in GHG emissions	Project developers and LFIs may need guidance and technical support to establish an adequate MRV system or financial incentives through performance-based financing	Case Study #13: IDC, South Africa
Lack of awareness of opportunities for climate change mitigation and economic benefits	Capacity building and awareness campaigns need to be provided to project developers and LFIs, building on key success stories	Case Study #14: Financiera Rural, Mexico

Case Study #1: Conducting education and awareness campaigns to promote development of the renewable energy and energy efficiency sectors

The Renewable Energy Center (www.cer.gob.cl), which was initially established as a unit within CORFO, works with roughly 400 project developers within Chile. The center helps build market knowledge by providing courses, workshops, seminars, training and other activities. It regularly gives feedback to the Energy Ministry regarding the needs and barriers facing renewable energy project developers. It also helps CORFO design financial instruments that complement and catalyze the participation of LFIs in project financing. The Renewable Energy Center provides information and financial support to its clients and receives funding from international donor sources, as well as the national government. The center's focus includes non-conventional renewable energy — geothermal, biomass, solar, wind and small-scale mini-hydro.

Case Study #2: Assuming the role of intermediary between government policymakers, project proponents and local banks

Sociedad Hipotecaria Federal (SHF) of Mexico brought together various government ministries and entities, including other PDBs within Mexico, to address the problem of sustainable urban and housing development. The group created a system for sustainable urban development, DUIS

(“Desarrollos Urbanos Integrales Sustentables”), as a public initiative to provide grant support for regional development. The initiative supports urban spaces that include housing, infrastructure, public services, commerce, education, health and industry and are environmentally, socially and economically sustainable. To date, the DUIS system has been applied to the development of four new cities. Residential housing in these new cities consists of brand new units with clean technologies. Homeowners pay 50 percent of the incremental cost of the technologies over conventional technologies, and the new technologies reduce energy consumption by as much as 35 percent. A “green mortgage”, also supported by the Instituto del Fondo Nacional de la Vivienda para los Trabajadores (INFONAVIT), a Mexican federal institute for worker’s housing, includes the additional costs of solar water heaters, CFL lighting, insulation and water use reducers.

Case Study #3: Helping create market demand for new technologies

FIRA analyzed the supply chain of the dairy industry in Mexico to determine where GHG reductions can be supported. As one important initiative, FIRA, along with milk buyers, is promoting incentives for cattle producers to use bio-digesters on their farms for waste-to-energy systems. Working with the cattle producers’ association and the Comisión Federal de Electricidad (a power utility company in Mexico), FIRA has arranged for farmers to make their capital investments and service the loans through their utility bills, which provides a more secure repayment method.

Case Study #4: Using grants to cover the costs of project preparation

The Development Bank of the Philippines was among the first-movers within the global PDB community to transform into a “green” development bank. Among many other initiatives, this bank offers conditional grants to prepare and develop projects, including help to fund the implementation of consultations processes within the local communities. These monies are made available to the bank through concessional official development assistance funds provided by the international donor community, and the bank then “wholesales” these funds. These grants include conditions such as the environmental impact assessment of the bank’s traditional projects and, where possible, they try to influence projects toward cleaner technologies by financing the incremental costs.

Case Study # 5: Structuring and leading the financing of new technologies

NAFIN (Nacional Financiera, SNC), whose mandate is to support the SME sector typically as a Tier 2 lender, recognized a market gap in the availability of long-term financing for technologies that had not yet been introduced in Mexico, such as wind. NAFIN wanted to promote wind farms but realized that, given the lack of familiarity of the local market with the technology, it would need to support the structuring of projects and arrange financing for them as a Tier 1 lender. By taking a learning-by-doing approach, NAFIN helped developers present the commercial banks with projects that were properly structured and investment ready. Project developers whose financing proposals had been previously rejected by LFIs approached NAFIN, even though it did not have direct experience in project finance. NAFIN strategically decided to work with developers to structure projects to make them bankable and then tried to identify LFIs who would be willing to co-finance them. .

Case Study #6: Supporting energy efficiency for small-scale energy consumers

Within Brazil, the ESCO market has developed well, but developing energy savings solutions for small industrial clients using a shared savings structure is not of interest given the risks. Local financial institutions are also not willing to extend credit to these small firms. Therefore, BNDES developed a loan facility for small consumers to finance the energy savings under the PRO-ESCO program. Credit lines have been put in place so that small industrial customers can get access to financing to commission an ESCO service.

Case Study #7: Helping LFIs to move into new risk areas using guarantees

FIRA has created a mutual guarantee fund called FONAGA Verde that is designed to support renewable energy projects and bio-fuels. With an initial investment of 200 million pesos, which will eventually rise to 2,500 million pesos, FONAGA Verde supports the financing of projects in the farming, forest, fishing and rural sectors. The guarantee covers 20 percent of the credit for long-term investments and 14.29 percent for short-term working capital.

Case Study #8: Supporting high potential technologies through venture capital

Bancóldex Capital was established in 2009 to address the market gap for venture capital and private equity in Colombia. As a Tier 2 PDB, Bancóldex invests in funds rather than directly into companies or projects. Bancóldex Capital has US\$50 million to invest and so far it has made four investments, including into a small venture capital fund called Progres Capital based in

Medellin. Progresa, a fund of US\$20 million, focuses on high growth potential companies in alternative energy, among other sectors, with individual investments ranging from US\$0.5 million to US\$2 million. The Inter-American Development Bank's (IDB) Multilateral Investment Fund co-invests in Progresa, and Bancóldex Capital is working with the fund to help the fund managers develop deal flow.

Case Study #9: Reducing the transaction costs for small-sized projects through bundling

COFIDE's COFIGAS is a program to convert fuel to natural gas for taxis and buses in Peru. Designed to amortize the cost of conversion through payments at the gas pump every time the vehicle is refilled, the program used an existing and secure payment mechanism, thereby improving the credit risk of individual loans and allowing wide-scale deployment. As of the end of 2010, some 135 gas stations had entered the program. The benefits have not only been reduced GHG emissions, but access to financing and a credit record for many taxi drivers. The key to this program has been to ensure that the technology platform that links COFIDE with gas stations and local banks throughout the country is reliable.

Case Study #10: Providing access to long-term foreign currency loans

The Croatian Bank for Reconstruction and Development (HBOR) has a green finance loan program that is refinanced by KfW Entwicklungsbank. For the program, KfW has granted HBOR a long-term, low-interest loan of €19.5 million. Funding is provided either directly to the project/obligor or through commercial banks, and HBOR finances up to 75 percent of the total funding package. Loan amounts are not limited but depend on HBOR's resources and risk capacity, as well as the credit profile of the project and borrower, and the quality of the security offered. HBOR will consider loan exposure periods of up to 13 years, including maximum one-year disbursement, two years grace and repayment of up to 12 years (including the grace period). Interest rates vary from a minimum of 4 percent per annum for projects in a region of special state concern to 6 percent for SMEs and three-month EURIBOR (Euro Interbank Offered Rate) plus 2 percent per annum for other borrowers.

Case Study #11: Financing large wind projects using a syndicated loan market

In Brazil, BNDES participated on a *pari passu* basis in a number of large wind projects with commercial banks. The LFI and BNDES are participating in the transaction on the same terms

and conditions. Because the transaction sizes are too large for any single LFI to manage, the PDB provides additional capacity by way of a direct Tier 1 loan to the project.

Case Study #12: Guaranteeing commercial banks that have reached their sector limits

Many of the larger LFIs in Peru have significant experience in and exposure to financing hydropower projects and, for internal risk reasons, may have reached their limits in the sector. A loan guarantee from COFIDE means that some of the risk is transferred from the counterparty (the LFI) to COFIDE.

Case Study #13: Offering longer term support for transactions

The Industrial Development Corporation of South Africa (IDC) operates a direct credit facility to support SME energy efficiency and renewable energy projects. Under the facility, IDC offers repayment terms of up to 12 years with no minimum loan amount. The corporation considers funding for fixed assets and working capital for greenfields, expansions and rehabilitations. The loan facility is funded by the Agence Française de Développement (AFD), a French financial institution and the main implementing agency for France's official development assistance to developing countries and overseas territories, under a €120-million credit facility to various commercial banks (including IDC) in South Africa.

Case Study #14: Facilitating the CDM process

Working with livestock producers and the Ministry of the Environment, Financiera Rural has prepared a program of activities for small-scale animal waste management systems. The program covers 254 anaerobic digesters with biogas capture (including 30 financed by FIRA), of which 46 have requested CDM registration. Financiera Rural expects the program to register more than one million carbon credits.

Recommendations and Conclusions

The following sets out the key factors a PDB must have in place to champion and be an active collaborator in helping its country catalyze international and private financing for projects to mitigate climate change. As mentioned in the introduction to this note, not all PDBs have the capacity or mandate to take on this important role.

The institutional framework is the foundation of a PDB's strategy for climate change mitigation. The successful development and implementation of a strategy depends directly on the PDB's capacity and motivation to promote environmentally friendly practices. A healthy institutional framework provides the necessary focus and impetus to implement worthwhile products and services.

A given strategy to mitigate climate change — and its underlying framework and mechanisms — that is successful for one PDB may or may not be appropriate for another. There are no one-size-fits-all approaches or solutions. Rather, an effective strategy, and the underlying means to implement it, is shaped by a host of factors specific to each PDB, which may include country- or region-specific dynamics, access to regional or international carbon markets, access to new global financing mechanisms, familiarity with innovative or emerging financing products, access to and depth of available donor-sponsored funds, relationships with local market intermediaries and the PDB's capabilities and resources (e.g., management, finances and technology). The extent to which a PDB's strategy is developed and deployed depends largely on how the PDB considers and responds to climate change dynamics in its own national economy.

A PDB can develop a climate change strategy by internalizing climate change and environmental sustainability concerns as part of its environmental responsibility and risk management. Further, the PDB can promote and develop financial products for LFIs and project developers to leverage investments that address climate change challenges.

By demonstrating a commitment to promote sustainable principles in its own operations and service delivery mechanisms, the PDB develops and instills an overarching institutional philosophy and orientation to promote environmentally friendly programs and initiatives.

Recommendations

At a fundamental level, PDBs should demonstrate a commitment to and understanding of sustainable business operations. By “walking the talk”, PDBs will have a degree of moral authority in promoting and building awareness of the benefits of reducing GHG emissions in

terms of energy savings and climate change, and will also have practical appreciation for the advancement of low-carbon initiatives.

That commitment and understanding could manifest itself in different ways, such as a PDB monitoring and reporting reductions in the carbon footprint of its own operations or promoting sustainable corporate business operations with others. For instance, a PDB could conduct environmental impact assessments as part of its due diligence and risk management process, or it could orient certain types of financial products to recognize or support “green” business practices, or it could promote the idea of a carbon efficiency index for certain industries.

Public development banks must also actively engage in promoting climate change activities with their clients. Such promotion can be achieved by:

- i) tailoring programs that blend grants, technical assistance, and local and international sources of funding to address the institutional, technical and financial needs of LFIs and project developers;
- ii) assuming a role in coordinating large mitigation programs; and
- iii) supporting implementation of adequate monitoring, reporting and validation systems for reductions in GHG emissions.

To sum up, PDBs can play an innovative role in supporting sustainable capacity building nationally, ideally helping promote the adoption of mechanisms to accelerate a country’s ability to support green projects. In this regard, their efforts could include providing technical assistance to develop project incubators; support the quality control of projects; bundle many small initiatives into larger programs; support the design and implementation of MRV systems for emissions reduction; advance the development of the legal and administrative conditions in a country for carbon finance; advise on legislation, regulation and technical standards; or help promote national environmental management systems.

Based on the lessons learned and best practices drawn from the experiences of PDBs inside and outside the region, any PDB preparing an intervention strategy for climate change mitigation needs to consider the following key factors for success.

Key Factors for Success

The PDB must have **regular, high-level interaction with relevant policymakers** to have direct input into the formulation of relevant regulatory regimes and incentive frameworks for projects to mitigate climate change. All PDBs interviewed for this report were engaged in regular policy dialogue with the government authorities in their country responsible for climate change. An excellent example is CORFO's Center for Renewable Energy, which regularly coordinates with the ministries responsible for policy and regulatory matters.

The PDB must **understand the needs of LFIs** to develop adequate products and services to stimulate investments in climate change mitigation. The most successful PDB programs were designed after thorough consultations with LFIs. By contrast, programs that were put in place without reference to specific and well-defined challenges being experienced by LFIs, saw little use. The importance of consultations with the LFIs is generally well understood by PDBs, but the degree of engagement and analysis of the challenges varies considerably. Thorough and detailed discussions with the LFIs about market gaps and the nature and rationale for these gaps are critical. Colombia's Bancóldex seeks to know its clients (the banks since it is a Tier 2 institution) well and has, as much as possible, developed relevant programs that are permitted within its policy and institutional framework.

The PDB must develop new initiatives and instruments to foster demand for finance by supporting **early-stage project development efforts and providing seed capital** to project developers. NAFIN's efforts to help structure projects and support feasibility studies for new technologies, such as wind, have opened the way for bankable projects.

The PDB must have **dedicated tools to catalyze private sector entities** to become financiers in projects. At an operational level, such tools include an array of financial and related services designed to support the development and implementation of projects or initiatives for climate change mitigation. The universe of potential financing mechanisms serves, in effect, as a toolkit from which the PDB can choose to develop and implement mechanisms that will best serve its strategy given its institutional framework orientation. Those PDBs, such as BNDES, with a large array of financial instruments (such as grant funding, technical assistance, equity, carbon finance, Tier 1 and Tier 2 concessional loans, guarantees and innovative financing mechanisms) available to implement a strategy for climate change mitigation could meet the needs of the market relatively readily and flexibly. Those PDBs that have only a single

instrument, such as a Tier 2 lending facility that provides liquidity to LFIs, may not meet the specific market gap.

The PDB must have the capacity to **develop innovative mechanisms in response to well-defined and analyzed market gaps, monitoring and adjusting mechanisms as warranted by changing market conditions**. A PDB that is aware of the needs of the private market and can design and structure instruments that meet the specific requirements of the prevailing market conditions will be more helpful than one that simply creates products without targeting a market need. NAFIN saw that it needed to innovate by offering to arrange financing and assist in structuring projects to draw in LFIs.

The PDB must **consider best practices** from other PDBs and organizations within the worldwide development banking community. In Mexico, development banks have come together around common goals, such as the DUIS (sustainable urban development) project and the financing of bio-digesters for agriculture. Each PDB has their own mandate and role within these sectors and a community of learning is being developed nationally. Regionally, within ALIDE, a new Environmental Financing Technical Committee, chaired by BNDES, has been established to discuss the creation of new financial products to help fight the effects of climate change. Globally, the World Federation of Development Financing Institutions (WFDFI), which has 328 member institutions in 154 countries, has launched the Global Sustainable Finance Network.

The PDB must **identify and focus on the specific sectors and market segments with the best potential** to have a demonstrable effect. COFIDE's implementation of programs supporting natural gas conversion within the transportation sector is evidence that a targeted effort within a particular market segment can have significant and high-profile effects. The conversion program is well known within the country, and its success has created awareness of and demand for other energy-saving financial products.

The PDB must **learn about technologies** that are suitable for climate change mitigation in its country. The PDB will benefit from understanding what technologies could help meet the challenges of climate change mitigation and the economics of their deployment. Although not a central activity, having this knowledge will allow the PDB to target sectors and industries where these technologies have the greatest potential. Financiera Rural, in its efforts to encourage a shift to alternative energy within the agricultural sector, has coordinated with producer associations

and equipment manufacturers to promote the certification of technologies to ensure that adequate warranties are in place for the equipment.

The PDB must seek **budgetary allocations from the government and access to donor funds** for specific initiatives that require grant funding. Since a PDB must seek to be financially self-sustaining, grants are required to undertake many of the climate-friendly initiatives, such as awareness building and policy advocacy, because there is no possibility of generating income from these activities. In addition, blending grants with the PDB's main financial instruments to create concessional (low-interest) loans or first loss reserves of a guarantee fund can address certain market gaps. Therefore, reliance on budgetary resources is often required, as is access to international donor funds, the conditions of which are often that the PDB meet certain environmental and social governance standards within its operations. The Development Bank of the Philippines has worked to create a strong link to grant funding from the national government and international donors by demonstrating the success of its programs. For example, the World Bank is using monies from the Clean Technology Fund, with the Development Bank of the Philippines as the implementing agency (World Bank, 2011).

The PDB must endeavor to **develop the market of specialized service providers in sectors such as energy, forestry and waste treatment**. Service providers, such as ESCOs in the energy efficiency area, are important to their markets and require focused attention from PDBs in terms of financing and technical support to successfully access those markets. BNDES's PRO-ESCO has helped small industrial consumers purchase ESCO services, while NAFIN has supported the financing of ESCOs by providing a guarantee to the LFI lending to the energy efficiency project.

The PDB must look for **wholesaling opportunities to aggregate multiple small-scale projects** into a single program to help reduce the costs to LFIs. The solution to reducing the transaction costs of multiple small projects is bundling similar projects together. COFIDE's natural gas conversion program is an excellent example of this technique. A multitude of micro-entrepreneurs (taxi drivers) have received credit from LFIs to purchase new vehicles or convert existing vehicles. The LFIs are backed by COFIDE's guarantee as well as its information and payment platform. Until this program was launched, these micro-entrepreneurs had no access to any credit; through this program they have been able to build a credit history, thus opening the way to new credit products in the future.

The PDB must consider establishing a **dedicated climate change unit** within the bank. All PDBs that are serious about developing and implementing a strategy for climate change mitigation have established a dedicated unit with senior, well-respected and competent people who can mobilize support from other parts of the organization and externally.

Conclusions

Large investments in climate change mitigation are required to achieve low-carbon growth in the region in coming decades, and this is only possible through public–private partnerships. Because of their particular nature, specific development mandate, and knowledge of local financial markets and long-term financing of investment projects, PDBs — with adequate support from international donors and their respective governments — can be among the most effective vehicles to leverage private sector financing for investment projects to mitigate climate change and to intermediate international financing for such projects. This note has provided an overview of the multiple barriers and risks that PDBs could help overcome to catalyze international and private financing for investment projects to mitigate climate change. It has also discussed lessons learned from a number of PDBs within the LAC region and examples of best practices, processes and products in support of financing projects for climate change mitigation from PDBs around the world.

One thing that this note has not attempted to do is provide detailed insights into the relative advantages that Tier 1 PDBs could have over Tier 2 PDBs in terms of financing projects associated with certain technologies and project sizes and vice versa. However, in a liquid funding environment in which LFI can borrow long-term funds, PDBs that can only offer Tier 2 loans may find their relevance and ability to influence this sector limited. Rather, those PDBs that can take on direct project or corporate risk through Tier 1 lending operations, or assume partial risks by guaranteeing programs or making equity investments, may find that they are more able to make a significant contribution to mitigating climate change in their country. Given that PDBs in LAC operate either as Tier 1, Tier 2 or, in some cases, at both levels, an examination of differential advantages should be an area for future research.

This note has not tried to look into the important role that PDBs could play in terms of influencing the operational design of the new international architecture for climate change finance (i.e., the Green Climate Fund) or in terms of coordinating and structuring new, large mitigation programs resulting in properly monitored, reported and verified reductions in GHG

emissions (also called Nationally Appropriate Mitigation Actions). Again, the analysis of the opportunities and challenges of having PDBs playing an active role on these fronts should be an area for future research.

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Annex A: Examples of Dedicated International Climate Funds

Sources of Funds	Description	Funds allocated to LAC
Multilateral Funds		
United Nations Climate Change Convention Funds		
Green Climate Fund	<p>The Green Climate Fund was established at the 16th Conference of the Parties, which was held in December 2010 in Cancun, Mexico. The Fund is expected to become the largest multilateral source of financing for climate change activities and to work as the financial mechanism of the Climate Change Convention. It is expected to finance activities in developing countries using thematic funding windows. To design its detailed modalities, the Conference of the Parties appointed a Transitional Committee that started to make recommendations at the 17th session, which was held in Durban, South Africa, from November 28 to December 9, 2011.</p>	Under negotiation
Global Environment Facility	<p>The GEF Climate Change Trust Fund has worked as the financial mechanism for the United Nations Climate Change Convention on Biological Diversity since its start-up. The IDB has been operating as an implementing agency of the GEF for 20 years. The Bank has continuously endeavored to proactively partner with host countries in building a portfolio of projects to transfer innovative technologies, create financing mechanisms and generate institutional capacity in support of mitigation strategies and plans in each country.</p> <p>In addition to the Climate Change Trust Fund, the GEF has been operating other funds, created under the Convention, specifically to support adaptation activities: the Special Climate Change Fund and the Least Developed Countries Fund (LDCF).</p>	<p>GEF Trust Fund: ~US\$50mn in GEF 5: 2010– 14</p> <p>SCCF: About US\$40mn available.</p> <p>LDCF: US\$10–\$12mn available per least developed country (in LAC, Haiti would be eligible)</p>

Sources of Funds	Description	Funds allocated to LAC
Adaptation Fund of the Kyoto Protocol	<p>Under the Kyoto Protocol, the Adaptation Fund was envisaged as assisting developing countries that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation. The Fund was also intended to assist in financing concrete, country-driven adaptation projects and programs. The Adaptation Fund receives 2 percent of the Clean Development Mechanism, with emission reduction certificates channeled to the account of the Fund's board, and also receives donor funds. The Fund is innovative in that it allows developing countries direct access to its resources.</p>	<p>While there are uncertainties about the size of future markets to support the CDM, under the current scenario and depending on value and volume of certified emissions reductions (CERs), the Fund is estimated to accumulate between US\$250–\$440mn. To date, the World Bank has monetized over 7mn tons of CERs for the Adaptation Fund, raising nearly \$120mn.</p>
Other Multilateral Funds		
Climate Investment Funds	<p>The Climate Investment Funds (CIF) support developing countries to pilot low-emissions and climate-resilient development. Launched in 2008 as a collaborative effort between member countries and the multilateral development banks (AfDB, ADB, EBRD, IDB and WBG), the CIFs aim to bridge the financing and learning gaps for low-carbon and climate-resilient development between now and a post-2012 global climate change agreement. A sunset clause enables closure of the CIF once a new financial architecture has become effective under the UNFCCC regime.</p> <p>The CIF comprises two distinct funds and provides a comprehensive structure through which concessional financing may be made available quickly and flexibly for both low carbon growth and climate resilience activities.</p> <p>The Clean Technology Fund (CTF) finances acceleration of transformation to low carbon growth paths through the cost-effective mitigation of GHG emissions by supporting sustainable transportation, renewable energy and energy efficiency programs.</p> <p>The Strategic Climate Fund is made up of three targeted programs with dedicated funding to provide financing to pilot approaches with the potential to scale up: The Pilot Program for Climate Resilience has leveraged around US\$100mn for pilot projects underway in Bolivia and the Caribbean region within LAC that are being supported by IDB. The Forest Investment Program has three pilots in LAC (Brazil, Mexico and Peru) totaling US\$180mn. The Scaling Up Renewable Energy in Low Income Countries Program currently has one pilot in Honduras (US\$30mn).</p>	<p>Over US\$6.3bn in donor pledges and all programs have now been allocated, with over 45 countries undertaking the CIF pilots. From these, about US\$705mn should be dedicated to eligible CIF countries in LAC.</p>

Sources of Funds	Description	Funds allocated to LAC
Forest Carbon Partnership Facility	The Forest Carbon Partnership Facility (FCPF) was launched in 2008, with US\$165mn mobilized. The FCPF aims to assist developing countries in reducing emissions from deforestation and forest degradation and through sustainable forest management under the Reducing Emissions from Deforestation and Forest Degradation (REDD+). The FCPF assists developing countries through a Readiness Fund to support capacity building (including elaboration of a REDD strategy, development of a reference scenario and establishment of a monitoring system) and a Carbon Fund to pilot payments for verified emissions reductions in the forestry sector. The FCPF helps to provide carbon finance to a sector-specific mechanism that was not included in the Kyoto Protocol's carbon regime and extends carbon financing beyond the 2012 limit. There are 37 participating countries, of which 13 have signed "REDD readiness grants."	About US\$10.8mn in total.
Multi-donor Dedicated Climate Change Funds		
	A number of climate dedicated funds with more than one donor (multi-donor funds) have recently been created. The European Commission has created two multi-donor funds that, through agreements with host countries and calls for proposals, provide grants and concessional financing. Through agreements with donors, some countries in LAC have established their own funds or developed joint initiatives to finance activities to address climate change. For example, Brazil and Norway under the Amazon Fund and Guyana and Norway under the Guyana REDD+ Investment Fund.	Approximately US\$1.3bn
Bilateral Funds		
	There is a significant amount of funding that have been pledged by donor countries as part of their commitments to the Climate Change Convention Bali Action Plan, in particular a pledge of up to US\$30bn between 2010 and 2012 (so called "Fast Track Finance"). In addition to channeling resources through multilateral climate funds, a number of donor countries have either created dedicated climate change fund mechanisms and/or increased resources for climate change as part of their existing development assistance support. While eligibility to participate and specific conditions/criteria differ for the various funds, most are highly concessional and provide substantial opportunity to leverage multilateral resources to address climate change in LAC.	At least 8 percent of fast track funds dedicated to climate change from bilateral funds should be dedicated to LAC amounting to approximately US\$1.8bn.

Annex B: The Kyoto Protocol's Clean Development Mechanism After 2012

Since there is no legally binding successor to the first emissions reductions commitment period under the Kyoto Protocol, there is considerable uncertainty about carbon financing through the Clean Development Mechanism (CDM) after 2012. To be clear, the Kyoto Protocol does not terminate in 2012; rather, it is the first round of commitments by Annex 1 Parties that expire on December 31, 2012. The CDM will continue to exist after 2012, and projects can continue to seek registration thereunder (i.e., to generate certified emissions reductions, or CERs). What is unclear is where exactly the demand for resulting CERs will come from (e.g., from future Kyoto obligations, from new national cap-and-trade schemes that allow international offsetting or continuing demand from EU ETS). This uncertainty will affect the price of CERs.

Projects that do not give rise to CERs may still give rise to verified emissions reductions, which are saleable. However, CERs, which can be used to fulfill Kyoto obligations, have tended to command a much higher price than verified reductions generated under the various voluntary standards.

The EU ETS, which pre-dates the Kyoto Protocol, will also continue to be operational after 2012, and most market players expect certain kinds of CERs to continue to be allowed to be used for compliance purposes. What is unclear is the import criteria for these CERs. For example, it appears that in the newest phase of the EU ETS, CERs from countries like China may no longer be eligible for compliance purposes. Indeed, it appears that after 2012 EU ETS Phase III may limit CERs to those arising in Least Developed Countries. This would effectively exclude every country in LAC except Haiti.

Emissions targets for a second commitment period under the Kyoto Protocol are currently being negotiated and the outcome is unclear. If new targets end up being expressed in a form other than a second commitment period under the Protocol, the form under which CDM activities continue will have to be addressed. However, trading mechanisms for ongoing CERs should continue to exist as long as there are cap-and-trade schemes, though the price will be much more volatile and likely much lower.