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Research Report

Securing climate finance through national development banks

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Report

Securing climate finance through national development banks

Stephany Griffith-Jones, Samantha Attridge
and Matthew Gouett

January 2020



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Acronyms

AADFI	Association of African Development Finance Institutions	IDFC	International Development Finance Club
ADB	Asian Development Bank	IFC	International Finance Corporation
ADFIAP	Association of Development Financing Institutions in Asia and the Pacific	IMF	International Monetary Fund
AFD	Agence Française de Développement (French international development agency)	JICA	Japan International Cooperation Agency
AfDB	African Development Bank	KfW	Kreditanstalt für Wiederaufbau (German development bank)
ALCB	African Local Currency Bond (Fund)	LCCR	low-carbon, climate-resilient
ALIDE	Latin American Association of Development Finance Institutions	LIC	low-income country
BNDES	Banco Nacional de Desenvolvimento Econômico e Social (Brazilian development bank)	MDB	multilateral development bank
BPI	Banque Publique d'Investissement	NABARD	National Bank for Agriculture & Rural Development of India
CDB	China Development Bank	NAFIN	Nacional Financiera (Mexican development bank)
CDG	Caisse de Dépôt et de Gestion (Moroccan development bank)	NDB	National development bank
CFF	Climate Finance Facility	NDC	Nationally Determined Contribution
CIF	Climate Investment Funds	NDFI	National Development Finance Institution
COFIDE	Corporación Financiera de Desarrollo (Peruvian development bank)	NIIF	National Investment and Infrastructure Fund (India)
CORFO	Corporación de Fomento de la Producción (Chilean development agency)	ODA	official development assistance
CPI	Climate Policy Initiative	ODI	Overseas Development Institute
CTF	Clean Technology Fund	OECD	Organisation for Economic Co-operation and Development
DBSA	Development Bank of South Africa	PSGRS	Prudential Standards, Guidelines and Rating System
DFI	development finance institution	PT SMI	PT Sarana Multi Infrastruktur (Indonesian development bank)
EBRD	European Bank for Reconstruction and Development	RDB	regional development bank
EIB	European Investment Bank	REIPPP	Renewable Energy Independent Power Producer Procurement Programme
FSD	Financial Sector Deepening (Africa)	SDG	Sustainable Development Goal
GCF	Green Climate Fund	SIDS	small island developing states
GEF	Global Environment Facility	SPV	special purpose vehicle
GIB	green investment bank	UDB	Uganda Development Bank
GIZ	Gesellschaft für Internationale Zusammenarbeit	UNDP	United Nations Development Programme
IADB	Inter-American Development Bank	UNFCCC	United Nations Framework Convention on Climate Change
IDC	Industrial Development Corporation (South African development bank)	US	United States

Executive summary

In November 2019, 11,000 scientists from around the world stated clearly and unequivocally that the world was now facing a climate emergency (Ripple et al., 2019). If we are to stand a chance of tackling this crisis, we must make fundamental changes to consumption and growth patterns and we must act now. Together, we need to transform our societies and our way of life and transition to a trajectory of low-carbon, climate-resilient (LCCR) global growth.

A key challenge in this collective endeavour is shifting the global investment and financing flows that underpin current and future growth to that LCCR trajectory. The global community recognises the challenge, which is one of three long-term goals of the 2015 Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC). In Article 2.1c, signatories to the Agreement committed to ‘making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development’ (United Nations, 2015).

National development banks (NDBs) and their governments are well placed to support this transformational change and the realignment of financial flows to ensure that they support the Paris goals. Further, it is very much in the interest of NDBs to understand and manage the financial risks to their investment portfolios from the transitional and physical risks of climate change. This study focuses on just one aspect of the transition, however: the need to invest in LCCR infrastructure to lock in LCCR growth trajectories and how NDBs can support this, both through direct financing and the mobilisation of private finance to fund the huge investment required.¹

The task of financing infrastructure of any type, but especially LCCR infrastructure in developing countries, is particularly challenging. In most cases, the initial investment is large, accounting for a significant part of the total investment. The payback period is long, however, so long-maturity financing is required. In many developing countries with shallow capital markets, such long-maturity financing is unavailable. If it is available, it is prohibitively expensive.

The challenge is further complicated by the fact that commercial viability is inextricably linked to technological risk of new technologies which are being introduced, or if current technologies are being adapted to different environmental conditions. Commercial viability is also linked to revenue generation (user charges, for example), which is susceptible to political risk over a longer period, as governments and policy are prone to change. Furthermore, there are significant externalities, such as decreasing carbon emissions, which have not yet been reflected in market prices.

Consequently, private finance does not naturally flow to those areas where it is most needed. Private investors have failed to provide stable and sufficient levels of long-term infrastructure financing at an affordable cost. This has been exacerbated by the introduction of tougher global financial regulations, such as Basel III, which has further reduced the incentives for long-term lending by commercial banks.

NDBs have a financial advantage in that they can access finance at longer maturities and more cheaply than private actors, so can provide lower-cost, longer-term financing for investment and/or co-investment in LCCR infrastructure. Frequently, they also have considerable

¹ For a more detailed discussion of the broader role of NDBs in supporting the realignment of all financial flows and their alignment with the Paris Agreement, see Climate Policy Initiative (CPI) and I4CE (2019).

non-financial advantages, such as greater accumulated engineering knowledge of certain sectors or projects, as well as more experience of existing and new technologies, than private financial institutions.

NDBs have a development mandate and are well placed to offset these market failures and financing constraints. For some reason, however, despite their potential value and collective firepower, which far exceeds that of the multilateral banking system, they have been neglected in the academic and policy literature and have yet to take a seat at the domestic and international policy table (Studart and Gallagher, 2016).

To aid the collective understanding and foster informed policy discussion at both the domestic and international level, we examine three interrelated issues: (1) the unique role that NDBs can play in supporting the transition to an LCCR economy and the tools and approaches they can use to this end; (2) the prerequisites to NDBs assuming this role and realising their potential; and (3) how NDBs can act as agents to access international climate finance.

Key findings

Finding 1

NDBs have traditionally acted as the public financiers of infrastructure investment, but as we transition to an LCCR economy, this role is changing. NDBs now have a dual function, as public financiers and as mobilisers and facilitators of private finance for investment. NDBs must step up their catalytic activities if they are to realise their full potential and support the transition to an LCCR economy.

We identify five key roles which NDBs can play to support the transition to an LCCR economy.

- **As financiers** of LCCR infrastructure investment.
- **As mobilisers** of external finance, either private or public, for LCCR infrastructure investment.
- **As intermediaries** that blend international climate and public development finance

with their own resources to help mobilise and scale up private investment in LCCR infrastructure.

- **As policy influencers** that can help shape broad and specific policy frameworks to encourage and channel private investment to LCCR infrastructure.
- **As pipeline developers** that can identify and develop bankable projects and/or invest in demonstration projects and new technologies that prove commercial viability.

These roles are not mutually exclusive; indeed, they are inextricably linked and mutually reinforce each other.

NDBs have several comparative advantages in these areas, thanks to their extensive knowledge of the opportunities for and barriers to investment in their countries, their long-standing relationships with the local private and public sectors, their sectoral and project expertise, their strong knowledge of their country's development needs and their ability to work closely with national authorities to support economic development plans. They also have the ability to fund not just marginal projects in existing sectors and technologies, but major, transformative projects that are key to the transition to an LCCR economy.

As growing emphasis is placed on the mobilisation of private finance and the realignment of financial flows, the importance of the blended financier, policy influencer and pipeline developer role increases to the point of critical. NDBs do not operate in a vacuum, however; government and regulators must ensure that policy frameworks are in place to incentivise LCCR investment. Still, NDBs can be more proactive. They can inform the development of policy frameworks, take the lead in project pipeline development, scale up their impact through replicable projects and be more innovative in their use of instruments and service delivery.

This is underway in some countries, where NDBs are already leaders in green investment, issuing green bonds to expand their green portfolios, advocating for more green investment and alignment with the Sustainable Development

Goals (SDGs), and fostering innovative LCCR investment and proving its viability.

Finding 2

There are five prerequisites to NDBs realising their potential to support the LCCR transition. We need ‘good’ development banks that are well governed, have clear green mandates, are adequately capitalised, are fully integrated into the policy process and have international support.

There is no doubt that NDBs have a significant role to play in supporting the transition to an LCCR economy, but we identify five key prerequisites.

- **Good governance:** NDBs need to be well governed and well run.
- **A clear mandate and a seat at the policy table:** NDBs need a clear ‘green’ mandate from government and this must be integrated into policy frameworks at both the domestic and international level. Moreover, NDBs can work with government and regulators to develop policy frameworks that incentivise much-needed private investment in LCCR infrastructure.
- **Sufficient capitalisation:** NDBs must be sufficiently capitalised to be able to operate on the scale required to support the transition to an LCCR economy in a meaningful way, including through major investments in new sectors and new technologies.
- **Access to developed local capital markets:** accessing and deepening local capital markets is necessary to overcome scale challenges and both real and perceived public-resource constraints in many developing countries. This will help support the realignment of finance flows with the goals of the Paris Agreement. An essential task here is that NDBs, working closely with their national governments, support the development of their local capital markets, particularly longer-term instruments.
- **International engagement and support:** close engagement with and support for NDBs by the international community can play an

important role in helping NDBs realise their potential to facilitate the transition to an LCCR economy (see findings 3 and 4).

A recurring theme throughout our research has been the importance and centrality of good governance. This is a fundamental prerequisite, as it underpins the willingness of governments to capitalise NDBs, the development banks’ ability to develop and tap capital markets and the willingness of private investors, multilateral development banks (MDBs), development finance institutions (DFIs) and international climate funds to partner them. Well-governed NDBs are more likely to have a seat at the policy table and be better able to deliver government objectives and support the transition to an LCCR economy, resulting in a virtuous circle.

Finding 3

International policy thinking is placing greater emphasis on the catalysation of private investment, where NDBs are recognised as important actors that do not just fund private LCCR investment directly, but also catalyse investment in LCCR infrastructure. The level of engagement of international institutions and actors varies, however. Some MDBs, regional development banks (RDBs), DFIs and climate funds are more engaged with NDBs than others, and NDBs are largely absent from international policy discussions. The engagement and support of the international community is particularly valuable in encouraging NDB governance reform, allowing NDBs to access concessional climate and international development finance to blend, build investment pipelines and build capacity.

Some of this lingering hesitancy harks back to a past era and real and perceived problems of poor governance. Our research finds in contrast, that many NDBs have been well governed and well run throughout their existence. Those NDBs that had previously suffered from poor governance are turning themselves around and reforming. We also find several examples of positive results from close cooperation and collaboration between NDBs and international

institutions and climate funds (author interviews, 2019).²

We identify below three key areas where such engagement and support yielded positive results and was particularly valuable.

- **Governance improvements:** a number of NDBs acknowledged that meeting the requirements to do business with MDBs and DFIs led to improvements in governance. While the process was onerous and bureaucratic, access to international climate funds had incentivised governance reform within NDBs and, interestingly, may have helped shield them from political interference, according to some NDB observations (author interviews, 2019).
- **Access to concessional international climate finance:** this is extremely valuable for NDBs, and not just for smaller ones, such as those in sub-Saharan Africa that rely on external public financing, as their national capital markets are not well developed or well capitalised. Access to concessional finance is also crucial for larger NDBs that raise finance on the capital markets and are not subsidised. It is often critical, too, in supporting NDB efforts to build a pipeline of bankable investment opportunities and enables NDBs to take on early-stage investment risk, which private investors shy away from. This is particularly important, as many interviewees in our study identify the lack of investible opportunities as a major constraint on the scaling up of investment in LCCR infrastructure (author interviews, 2019).
- **Building capacity:** we find many examples where MDBs, DFIs and international climate funds had helped build the capacity of NDBs, especially in the area of pipeline development; entering new sectors, such as renewable energy, which is crucial to investment in the transition to a LCCR economy; and supporting NDB capacity and efforts to access climate finance and get accreditation to directly access the Green Climate Fund (GCF).

Finding 4

Access to international climate funds by NDBs can be extremely valuable and help NDBs to develop their green investment portfolios and mobilise private finance. To date, however, direct access to these funds has mainly been the preserve of the multilateral system and bilateral Organisation for Economic Co-operation and Development (OECD) DFIs. Disbursement has been slow and access requirements and processes can be long and cumbersome.

While international climate finance does not account for a significant amount of total annual climate-finance flows, access to international climate finance on concessional terms has been extremely valuable for NDBs (author interviews, 2019). As mentioned, it is often critical in supporting NDB efforts to build a pipeline of bankable investment opportunities and enabling NDBs to take on early-stage construction investment risk that private investors are reluctant to shoulder. It also enables NDBs to invest in new sectors and technologies and fund projects to be showcased to the private financial sector for investment. As mentioned in Finding 3, many of our interviewees highlighted a lack of investible opportunities restricting LCCR investment.

However, as we note in our review of the climate-finance landscape (chapter 2), there are certain issues that need attention, especially now that the GCF and Global Environment Facility (GEF) have benefited from significant replenishment. There appears to be a disconnect between international climate-finance requirements and the importance of and need for national ownership. Most large international climate funds are channelled through the multilateral system, bypassing NDBs (although it is important to note that the GCF is much more focused on direct national access). While a number of NDBs have recently been accredited, many report that they have found the GCF accreditation processes to be extremely burdensome and question whether it is worth committing resources and effort to access

2 For a full list of institutions interviewed, please see Annex 1.

small amounts of concessional finance (author interviews, 2019).

Policy recommendations

We identify a number of key policy recommendations that should be actioned at the national and international level to unleash NDBs' full potential.

Governments need to:

- give NDBs a clear and stable 'green' mandate, in addition to their support of national development strategies, including an obligation to help meet the SDGs more broadly. This could include not just funding and encouraging investment in low-carbon activities, but also restricting – or even eliminating – funding investment in high-carbon activities, such as fossil-fuel electricity generation;
- integrate NDBs into their policy framework and design. Governments should ensure that supportive policy and regulatory frameworks are in place, both to facilitate NDBs' direct lending and long-term investment in activities to support green transformation and to help catalyse private flows to those activities;
- ensure NDBs are well resourced and have sufficient capital. Governments should facilitate greater leverage of private resources, especially in countries with deep private capital markets. Where these do not exist, governments and NDBs should help to develop and deepen them;
- help develop not just the financial, but also the valuable non-financial roles of NDBs.

NDBs need to:

- strengthen their governance and management;
- shift their business model from that of 'financier' to a dual function of 'financier and mobiliser' and adopt a more strategic and dynamic approach to market development and the mobilisation of private investment for LCCR;

- adapt and choose a mix of instruments to maximise impact on LCCR investment, while limiting contingent liabilities;
- seek to understand and manage the transitional and physical risks of climate change to their investment portfolios.

At the international level, MDBs, DFIs, donors and the international community need to engage with these institutions:

- to support and build the capacity of NDBs, as well as to ease excessively burdensome access hurdles to climate finance funds and channel the majority of international climate finance directly through national institutions, particularly NDBs, rather than the multilateral system;
- to help international climate funds understand how NDBs operate, thus helping to facilitate their access to such finance.

Future research

We have pinpointed a number of areas that would benefit from further study.

- **The role of NDBs:** a better understanding of the role of NDBs in tackling climate mitigation and in building climate resilience through adaptation investment. It also entails an appreciation of the non-financial role of NDBs in supporting the transition to an LCCR economy and what new accountability frameworks are required as NDBs transform into dynamic mobilisers and facilitators, as well as financiers.
- **Instruments:** a better understanding of how NDBs can innovate and introduce new instruments and a careful evaluation of the advantages and disadvantages of different tools, especially with a view to promoting increased investment in an LCCR economy.
- **Governance:** how best to ensure good governance of NDBs and to understand and articulate the value of well-run NDBs.
- **Business models:** an analysis of the optimal size of an NDB based on country circumstances, the speed at which operations

should be scaled up at and what, if any, risks are attached to this.

- **Centralisation versus decentralisation:** whether it is better to have one centralised NDB or a number of regional branches, and whether it is better to have one large development bank that focuses on a number of sectors or specialised sectoral development banks.

In summary, the crucial role of NDBs is becoming more and more recognised, but there is much to be done if NDBs are to become part of the discussion and be fully acknowledged as key actors in the development- and climate-finance architecture at international, regional and, in particular, national level.

To fully realise their potential, NDBs need to improve their own performance through better governance and new business models. They also need to help governments forge the right policies, such as broader macroeconomic and regulatory frameworks and deeper domestic capital markets, to help them to operate more effectively and support the transition to an LCCR economy.

Scale is also very important and governments need to ensure that NDBs are adequately capitalised, so they can help to finance the transition to an LCCR economy at sufficient scale and speed, given the urgency of the climate crisis. Most international climate finance is channelled through the multilateral system, bypassing the national institutions that are uniquely placed to leverage it to maximum effect. This clearly needs to change.

1 Introduction and overview

1.1 Introduction

The global community is at a crossroads. In November 2019, 11,000 scientists from around the world stated clearly and unequivocally that the world was now facing a climate emergency (Ripple et al., 2019). We must urgently make fundamental changes to current consumption and growth patterns if we are to stand a chance of tackling this crisis. Pursuing economic prosperity cannot come at the expense of the environment; we must act now. Together, we need to transform our societies and our way of life and move to a trajectory of LCCR global growth. A key challenge in this collective endeavour is the urgent need to transform the investment and financing flows that underpin current and future growth. This recognised challenge is one of the three long-term goals of the 2015 Paris Agreement of the UNFCCC. In Article 2.1c, signatories to the Agreement committed to ‘making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development’ (United Nations, 2015).

NDBs, together with their governments, are well placed to support this transformational change and a realignment of all financing flows to ensure they contribute to the goals of the Paris

Agreement. Furthermore, it is very much in the interest of the NDBs to understand and manage the financial risks to their investment portfolios associated with the physical effects of climate change and the transition to an LCCR economy (Bank of England, 2018).³ This study focuses on just one aspect of this agenda, however: the need to invest in LCCR infrastructure to lock in LCCR growth trajectories and the role of NDBs in supporting this investment through their financing and the mobilisation of private finance to fund the huge investment required.⁴

Given the exigence of the situation, attention must now turn to who is best placed to lead the charge. We urgently need to attract additional private and public finance to climate-smart investment, specifically infrastructure, and to determine the public actors that will play key roles in the process. While there has been much focus on the role of MDBs, RDBs and DFIs in catalysing public and private investment, there has been far less attention on NDBs. This oversight means there is a major gap in the general understanding of and emphasis placed on their role, not least because the collective scale of NDB assets is significant, far exceeding that of the core multilateral system. Estimates place the total cumulative assets of NDBs at \$5 trillion, well in excess of the assets held by MDBs

3 The financial risks of climate change are twofold: ‘Physical risks can arise from climate and weather-related events, such as heatwaves, droughts, floods, storms and sea level rise. They can potentially result in large financial losses, impairing asset values and the creditworthiness of borrowers... Transition risks can arise from the process of adjustment towards a low-carbon economy. Changes in policy, technology and sentiment could prompt a reassessment of the value of a large range of assets and create credit exposures for banks and other lenders as costs and opportunities become apparent.’ Bank of England (2018).

4 For a more detailed discussion of the broader role of NDBs in supporting the realignment of all financial flows and their alignment with the Paris Agreement, see CPI and I4CE (2019).

(Stuart and Gallagher, 2016) or the amount of annual official development assistance (ODA) provided by OECD donor countries (OECD, 2019b).

Moreover, NDBs have non-financial advantages that could be beneficial in locking in a climate-smart growth pathway. They have local expertise and the potential to integrate their operations into broader government mandates, which increasingly include giving priority to a mandate for the structural transformation to a low-carbon economy. NDBs have demonstrated their capacity to support the development of a pipeline of bankable projects and underpinned the development of domestic financial sectors to channel potentially huge institutional-investor assets into infrastructure investment. They are uniquely placed to intermediate both domestic and international finance from public and private sources into long-term finance for projects and programmes that require patient capital. As we will discuss, it is in this role as a mobiliser of finance for LCCR economic development where NDBs can be incredibly influential, in addition to their more traditional role of financier. More broadly, development banks are best placed to channel private and public finance into meeting the SDGs.

In many of the emerging and developing countries in which NDBs operate, the need for long-term public finance is particularly acute, due to the shallowness of their domestic financial markets, the prevalence of short-term financial assets and liabilities, and the volatile nature of private investment in such markets. These problems are more pronounced during and after financial crises, when investors become decidedly risk averse and unwilling to provide long-term finance – a key requirement of infrastructure investment (Griffith-Jones et al., 2018b). Traditionally, this situation has meant that the capacity to finance long-term investments, such as infrastructure, is limited, forcing firms to rely on short-term loans or the reinvestment of retained profits. Moreover, a lack of long-term finance implies even more serious constraints on new firms and activities associated with structural change, such as the major overhaul needed to create LCCR economies. Here, the key roles for NDBs are clear, as we will discuss.

Fortunately, in most regions, the scale and importance of development banks has increased in recent years. In Asia, the creation of the Asian Infrastructure Investment Bank and the New Development Bank (formerly the BRICS Development Bank), along with the asset growth of the China Development Bank (CDB), have highlighted the potential for these institutions to be market leaders in the transition to an LCCR economy. In Europe, the ambitious Juncker plan, which greatly expands the role of the European Investment Bank (EIB) and leverages its impact on European economies, has made the EIB an even more important partner for European NDBs. NDBs' role has also been increased and new development banks have been created. Governments in Africa have formed new NDBs in countries such as Nigeria and Ghana, while significant improvements in NDB governance and operations have been made elsewhere on the continent, according to the Association of African Development Finance Institutions, (AADFI)'s Prudential Standards, Guidelines and Rating System (AADFI, 2019).

However, the world's NDBs have been largely neglected in the academic and policy literature, despite their great value and increased scale. There is therefore a need to explore the key issues associated with NDBs: how they operate, what instruments and governance structures are more effective, how they tie in with broader government policies, how NDB scale influences their impact and, importantly, how they are linked to private financial agents and the private sector in general, as an important objective should be to promote private investment. It is particularly important to apply this in-depth analysis to the most urgent task at hand, to rapidly and radically transform economies to an LCCR model. This study constitutes an attempt to contribute to that undertaking.

1.2 Methodology

We chose a combination of qualitative and quantitative methodological approaches for this research. First, we conducted a desk-based review and analysis of relevant literature on NDBs, infrastructure finance, green finance and the financial instruments employed by MDBs,

DFIs and sovereign wealth funds. We also reviewed the annual reports of the major NDBs to better understand their operations. Second, we analysed publicly available data on international climate funds and NDB-issued green bonds. Third, we interviewed 15 NDB stakeholders, including representatives from NDBs, NDB associations and consultancies that have advised NDBs, along with RDBs, international climate funds, international organisations and international think tanks (see Annex 1 for a full list).

1.2.1 NDBs as the unit of analysis

NDBs are heterogeneous. They vary in numerous aspects, including size, mandate and integration into government policy-making. The World Bank's 2017 Survey of National Development Banks notes that NDBs are also often referred to as policy banks, DFIs, public banks or promotional banks, depending on the country in question. It observes that 'development banks' can refer to 'any type of financial institution that a national government fully or partially owns or controls and has been given an explicit legal mandate to reach socioeconomic goals in a region, sector, or market segment' (de Luna-Martinez et al., 2018: 12).

In their mapping of DFIs worldwide, Xu, Ren and Wu used the term 'national development finance institutions' (NDFIs), defining these as 'legally independent and government-supported financial institutions in pursuit of public policy objectives' (Xu et al., 2019: 14). Based on this classification, their research identifies 442 NDFIs in 147 countries, spread across various income groups and largely concentrated in Latin America and the Caribbean and sub-Saharan Africa (see Table 1).

Both the World Bank and Xu, Ren and Wu agree that most of these institutions have either general or multi-sector mandates. Among those with single-sector mandates, both studies found prevalent support for agriculture and small and medium-sized enterprises. The World Bank survey showed that 13% of the 64 respondents were narrowly focused on infrastructure (de Luna-Martinez et al., 2018), compared with only 1.4% of NDFIs in the Xu, Ren and Wu (2019) study.

Table 1 Countries with National Development Finance Institutions

Income group	Countries with NDFIs	Total number of countries
High-income countries	47 (59.5%)	79
Upper-middle-income countries	22 (64.7%)	34
Lower-middle-income countries	37 (80.4%)	46
Low-income countries	39 (69.6%)	56

Source: Xu et al., (2019)

For the purposes of this report, there are two important points about the NDB universe to consider. First, the size and scale of NDBs vary significantly. In their analysis of NDBs, Studart and Gallagher (2016) estimated that there were more than 250 NDBs at the time of their study and that these entities held total assets in excess of \$5 trillion. However, they also revealed that around 10 NDBs operating in China, Germany, Brazil, India and South Africa accounted for \$2.9 trillion, or almost 60%, of those assets. This finding is corroborated by the World Bank survey, which found that 38% of NDBs had assets of less than \$1 billion and that 47% of the surveyed NDBs held less than 10% of the total assets of their national banking systems (de Luna-Martinez et al., 2018).

Thus, the role that different NDBs can play in the transition to an LCCR economy varies significantly. Some will have the funding and internal capacity to take the lead on investments in LCCR infrastructure, but these are the exception rather than the rule. Infrastructure investment is costly. NDBs interested in supporting this transition must assess their balance sheets and find their niche. For some, this may be as a lead lender or arranger, but for many smaller NDBs, project preparation and pipeline development may be more aligned with their capacity to support the LCCR transition agenda.

It is also crucial that NDBs' mandates are transformed over time and that a specific mandate does not preclude an NDB from investing in LCCR infrastructure in the pursuit of fulfilling another mandate. For example, the

Uganda Development Bank (UDB) cites part of its mandate as being in line with the Government of Uganda's development priorities, which direct much of the bank's investment to agriculture. Nonetheless, UDB has indicated that some of these investments in agriculture could be classified as investments in infrastructure and that it is hoping to 'green' those investments further in the future (author interviews, 2019).

1.2.2 LCCR development

We refer to 'LCCR' throughout this report. The term has several definitions and can be understood in different ways, but the concept essentially speaks to a policy and action agenda that seeks to simultaneously tackle climate mitigation, adaptation and development issues in an integrated way. Much of our focus has been on the mitigation aspect (for example, renewable energy investment) rather than adaptation issues, which build climate resilience. Further study of NDBs and adaptation investment is necessary, as the challenges, approaches and instruments are likely to vary by sector (for instance, between smaller-ticket and high-risk investments, or agriculture and infrastructure).

1.3 Overview

To ground our analysis, chapter 2 highlights the current state of the climate-finance architecture and how NDBs, among a field of actors, are participating in the global transition to an LCCR economy.

Chapter 3 sets out the argument underpinning the necessary role of NDBs, discussing five key roles NDBs play in supporting LCCR investments and how they have comparative advantages that enable them to perform these roles well: (1) as financiers, providing both non-concessional and concessional finance; (2) as mobilisers of private finance; (3) as intermediaries in blending finance; (4) as shapers of policy frameworks; and (5) as supporters of innovative projects and by helping in the transition of one-off projects to more replicable and scalable ones. This section highlights how NDBs are becoming ever more focused on mobilising funds and employing strategic innovations that complement their traditional role as financiers.

Chapter 4 examines the prerequisites to NDBs realising their potential to support the transition to an LCCR economy. These include good governance, a clear mandate and seat at the policy table, sufficient capitalisation, well-functioning and fairly developed local capital markets to leverage domestic private savings, and international support.

Chapter 5 outlines a number of high-level policy recommendations for action at the national and international level based on the prerequisites identified in chapter 4.

Chapter 6 presents our policy conclusions and suggestions for future research.

2 The current climate-finance architecture

2.1 NDBs and international climate funds

The UNFCCC Standing Committee on Finance (2018) uses the term ‘climate finance’ to refer to financial resources dedicated to adapting to and mitigating climate change globally, including in the context of financial flows to developing countries. Therefore, while the term may evoke climate funds, such as the GEF and GCF, it also encompasses domestic government investments, ODA, commercial investments and green project development costs. Because of the multitude of actors, it can be difficult to ascertain where NDBs fit into the landscape and where they stand in relation to the other international institutions created to tackle issues associated with climate change.

Well-governed, well-capitalised NDBs should be an important partner of international institutions, as many are involved in the development plans of their governments and have on-the-ground expertise that international actors cannot match. NDBs know local sectoral needs, local projects, local actors and local sources of capital that can be tapped to leverage the funds provided by international sources. Moreover, thanks to this local presence, NDBs are attuned to market trends and among the first to detect when private investment is ebbing and when counter-cyclical investment is needed.

While there is potential for NDB and climate-fund collaboration, this has been slow, despite mutual best efforts. Finance from multilateral climate funds largely flows through MDBs,

RDBs and agencies of the United Nations. There are several reasons for this, largely down to the funds’ differing business models. One explanation, often raised in our interviews, was that NDBs lack the capacity to meet the funds’ rigorous fiduciary standards and the requirements of their environmental and social policies. Another explanation put forward was that the international climate funds do not understand NDBs and how they operate (author interviews, 2019). Essentially, there appears to be a disconnect between climate-fund requirements and the importance of having well-placed local actors involved in deploying the funds.

2.2 Private providers of global climate finance

The Climate Policy Initiative (CPI) has estimated that in 2018, just over half of global climate finance originated from private actors, of which 32% was invested by corporate actors – including project developers (see Figure 1) (Buchner et al., 2019). While this may reflect the potential revenue corporate actors expect to reap, it is surprising that institutional and alternative investors⁵ account for such a small proportion of climate investment. The lower figures may be a function of the secrecy of alternative investors or the difficulty CPI faced in securing accurate data in 2018. Institutional investors’ green investments, meanwhile, can be channelled through green bonds and not directly to projects, leading to under-reporting. Regardless, institutional investors should take on a greater

5 Alternative investors include private equity, venture capital and private infrastructure funds.

future role if initiatives such as the Climate Action in Financial Institutions Initiative⁶ and the One Planet Sovereign Wealth Fund Framework are to be successful.⁷

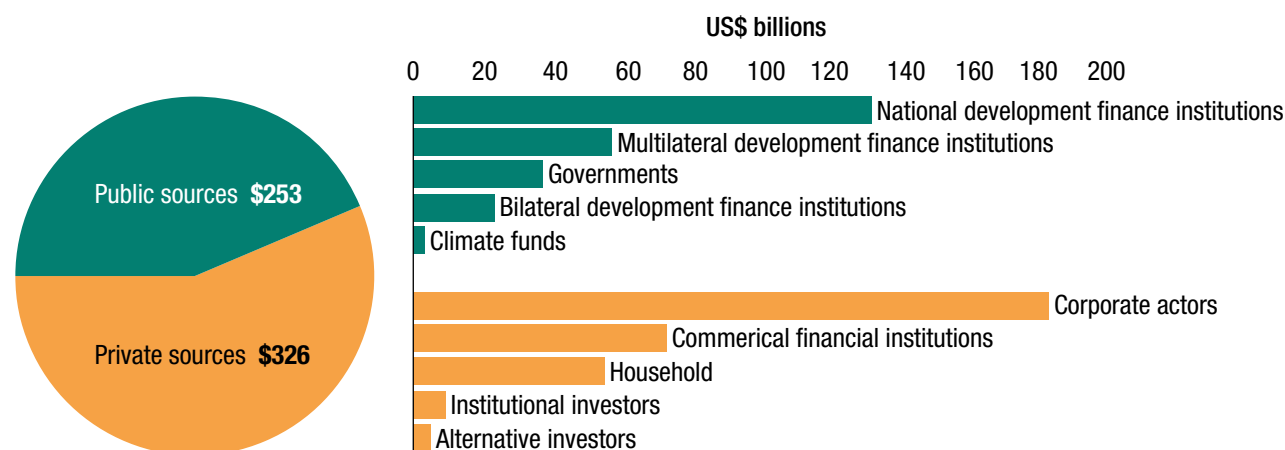
2.3 Public global finance actors

According to CPI, the largest share of climate finance from public actors comes from what it describes as national development financial institutions; for the purposes of this analysis, these are largely NDBs.⁸ CPI estimates that average annual flows from these entities in 2017 and 2018 totalled \$132 billion, or 23% of the annual average total of \$579 billion from all actors. This is more than twice that from

multilateral development banks (\$57 billion) and utterly dwarfs the \$3 billion in flows from international climate funds (CPI, 2019). The International Development Finance Club (IDFC) provides further guidance, stating that its members actually made \$150 billion in annual climate finance commitments between 2014 and 2018 (IDFC, 2019).⁹ Note that the majority of climate finance from NDBs is considered market-level debt, while flows from international climate funds have a larger grant element,¹⁰ which can carry a higher risk on investment and so be used to be fund the highest-risk demonstration or transformational projects.

Data on domestic government spending on climate initiatives is sparse. From the

Figure 1 Average annual public and private climate flows, 2017–2018



Source: CPI (2019)

6 The Climate Action in Financial Institutions Initiative is a coalition of 38 public and private financial institutions that aim to adopt a pathway that systematically integrates climate-change considerations into their strategies, programmes and operations. For more, see (Climate Action in Financial Institutions, 2017).

7 The One Planet Sovereign Wealth Fund Working Group was established in 2017 to accelerate efforts to integrate financial risks and opportunities related to climate change into the management of large, long-term asset pools. The six founding members are the Abu Dhabi Investment Authority, Kuwait Investment Authority, New Zealand Super Fund, Norges Bank Investment Management, Public Investment Fund of Saudi Arabia and the Qatar Investment Authority. Collectively, these sovereign wealth funds own assets totalling \$3 trillion (One Planet Sovereign Wealth Fund, 2019).

8 The flows captured by CPI (2019) are those from national development finance institutions where a single country owns the institution and the finance is directed domestically.

9 The difference between IDFC and CPI's figures is likely down to the fact that CPI classifies some IDFC members as bilateral and multilateral development finance institutions rather than NDFIs.

10 For example, 45% of GCF commitments were made in the form of grants (GCF, 2019c).

most recent UNFCCC Biennial Assessment, the annualised expenditure by countries that reported such figures for 2015 and 2016 was \$67 billion (UNFCCC, 2018). However, figures were only reported by 16 developing countries, the European Commission, France and one province of China. Countries are probably spending far more on activities that could be classified as mitigation or adaptation, but simply not reporting it. Without such important data, it is impossible to completely understand how much climate finance is flowing.

2.4 Multilateral climate funds

As we will discuss, some NDBs are working with climate funds to develop their green portfolios. Thus, even though climate fund flows remain small compared to NDB flows, understanding the landscape of climate funds is important, as they can play a valuable role in helping NDBs to develop their green investment portfolio, for reasons we discuss in chapter 4. It is also worth bearing in mind that climate funds may be more important to NDBs that are not well capitalised, or in countries where the impact of climate change is an existential threat, such as small island developing states (SIDS). The defining feature of climate funds is their diversity, as reflected in their disparate business models (see Table 2). Not only are the sponsors of

Table 2 Business models of four multilateral climate funds

Fund	Implementing entities	NDB implementing entities
GEF Established in 1991	18 agencies that create project proposals and then manage these projects on the ground; predominately multilateral development banks (MDBs) and United Nations agencies	<ul style="list-style-type: none"> • Development Bank of South Africa (DBSA)
Climate Investment Funds (CIF) Established in 2008	5 MDBs – the African Development Bank (AfDB), Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IADB) and World Bank Group – implement CIF-funded projects and programmes	<ul style="list-style-type: none"> • None
Adaptation Fund Established in 2009	47 implementing entities receive direct financial transfers from the fund to carry out adaptation projects and programmes Implementing entities are categorised into three groups: National entities = 29 Regional entities = 6 Multilateral entities = 12	<ul style="list-style-type: none"> • Banque Agricole du Niger • National Bank for Agriculture & Rural Development of India (NABARD)
Green Climate Fund (GCF) Established in 2010	88 accredited entities develop funding proposals to be considered by the fund and then oversee, supervise, manage and monitor their respective GCF-approved projects and programmes AEs are categorised into three groups: National entities = 38 Regional entities = 13 Multilateral entities = 37	<ul style="list-style-type: none"> • AFD • Banco Nacional de Desenvolvimento Econômico e Social (BNDES) • CDG Capital, Morocco • DBSA • Fiji Development Bank • Financiera del Desarrollo, Colombia (COFIDE) • Korea Development Bank • Kreditanstalt für Wiederaufbau (KfW) • NABARD • PT Sarana Multi Infrastruktur, Indonesia (PT SMI) • Small Industries Development Bank of India

Source: Authors' compilation, as of 1 November 2019

climate funds numerous (whether multilateral, bilateral, private or some combination thereof), but the means by which they invest climate finance are also varied, offering broad scope for NDB interaction. Grants, equity, loans, guarantees and technical assistance are among the most popular mechanisms, but are by no means the only ones.

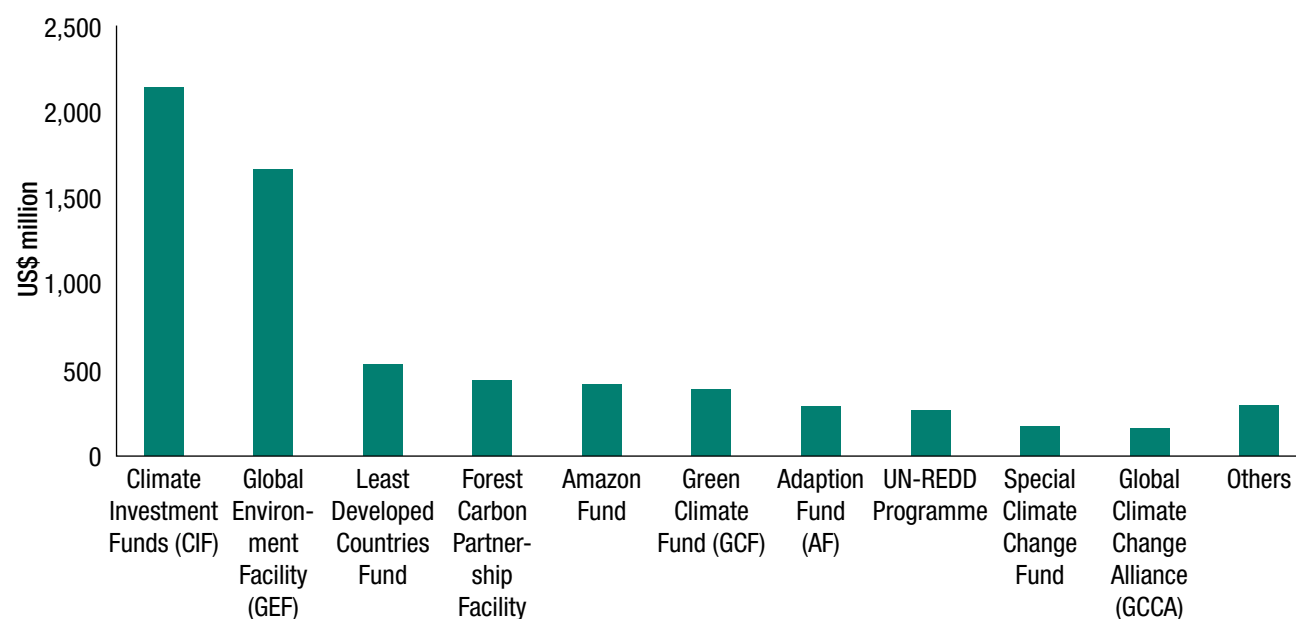
2.4.1 Sponsors of climate funds

The OECD's 2015 study of climate funds classifies 91 funds by source of funding (OECD, 2015a). While the inventory does not capture all of the funding being channelled to climate initiatives, it does provide one main insight: there are myriad channels funded by multilateral partnerships into which NDBs and other entities can tap.

Among the multilateral climate funds, there is an increasing amount of funding being disbursed, but also a growing concentration of the entities controlling these funds. The CIF¹¹ has been the largest disburser of multilateral climate funds to date, followed by the longer-standing GEF (see Figure 2).¹²

Recently announced donor contributions to the GCF are likely to see it become the largest global climate fund in the future. In October 2019, 27 countries announced \$9.7 billion in pledges to the GCF in a first replenishment of the Fund (Kosolapova, 2019). However, the United States (US), the largest funder of the GEF, CIF and GCF, has now announced the start of its formal withdrawal from the Paris Agreement. Aside from its failure to pledge to replenish the GCF, the impact of this about-turn in the US

Figure 2 Cumulative disbursements from major multilateral climate funds to 2018



Source: Climate Funds Update, 2019

11 The CIF consists of the Clean Technology Fund, the Pilot Program for Climate Resilience, the Forest Investment Program and the Scaling Up of Renewable Energy in Low Income Countries Program.

12 Figure 2 shows that, based upon disbursements, CIF has been most active. However, the Green Climate Fund (GCF) has approved the most funding to date. If these promised funds are disbursed as intended, GCF is likely to lead in terms of disbursements in the near future.

position on global climate funding has yet to be ascertained.¹³

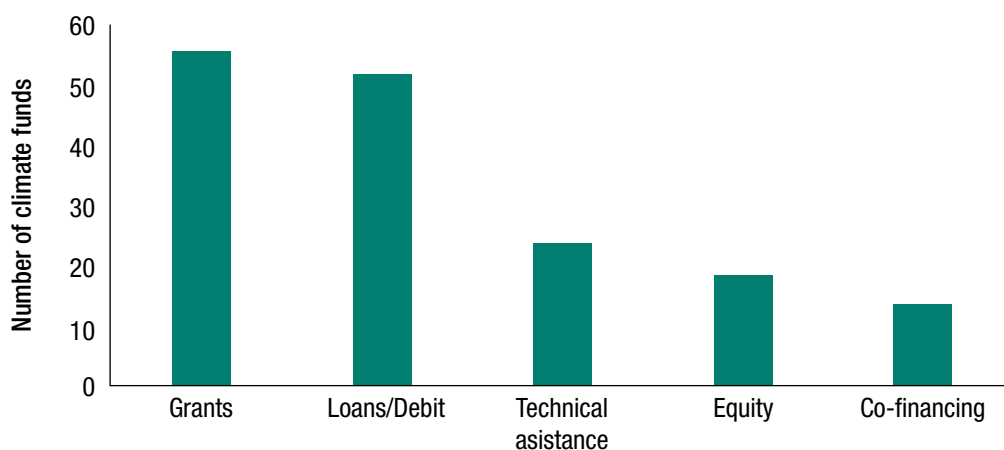
2.4.2 Targeting of climate funds

Climate funds seek to address diverse issues. The OECD's climate fund inventory (OECD, 2015a) lists nine different purposes and more than 75 different terms to describe the sectors these climate funds invest in. Unsurprisingly, mitigation and adaptation are listed as the purpose of most, with capacity development cited by a third. Among the most prevalent sectors in the OECD classification are renewable energy, energy efficiency and energy in general; each is listed as a sector of interest for more than 20 funds. Forestry and agriculture also feature heavily.¹⁴ While this points to diversity among climate funds, it also suggests opportunity for NDBs in the variety of potential funding partners that could support the sectors they wish to focus on. Of the climate funds listed, only eight indicated support for infrastructure. This low number may reflect the classification methodology, as climate funds may undertake infrastructure investments that are categorised as having a different purpose.

2.4.3 Instruments

These 91 climate funds also use different types of investment instruments to maximise impact. Unsurprisingly, most funds use grants and loans in tandem to support investees; with loans either at market or concessional rates (OECD, 2015a).¹⁵ As we discuss in later sections, it is notable that guarantees and contingent financing (not illustrated in Figure 3) were only offered by 10 of the 91 funds. Guarantees offer great potential to crowd in private investment to climate-finance projects and programmes, yet are rarely used (Lee et al., 2018; IDFC, 2018). This may partly be because there are also problems associated with them, such as a reduced ability to steer investment to genuine LCCR projects and sectors, as well as the creation of large contingent liabilities (Griffith-Jones and Naqvi, forthcoming). At the other end of the spectrum, the use of grants has proven effective in mobilising capital, but requires significant outlay. Maximising the sustainable development impact of grants is key, as these resources are scarce and therefore need to be allocated efficiently.

Figure 3 Top five instruments cited by climate funds



Source: OECD (2015a)

13 It is important to note that the US pledged \$3 billion under the initial resource mobilisation of the GCF under the Obama administration; it actually contributed \$1 billion. Under the Trump administration, it is unclear whether the remaining \$2 billion will be forthcoming (Climate Transparency, 2019).

14 Note that many funds had multiple purposes and multiple sectors of interest.

15 The OECD Climate Fund Inventory (OECD, 2015a) does not disaggregate between funds that provide concessional loans and funds that provide non-concessional market-rate loans.

3 Role of NDBs in supporting the transition to low-carbon, climate-resilient economies

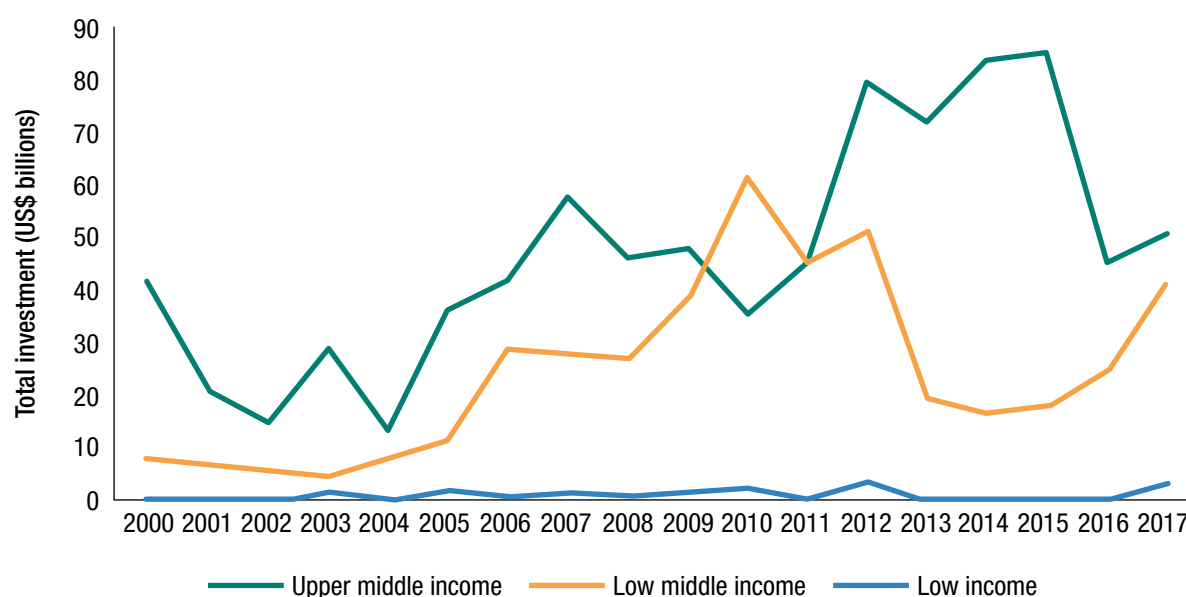
3.1 The argument for NDB involvement in LCCR investment

There is no question that the global economy urgently needs to shift to an LCCR growth trajectory if the world is to stand a chance of meeting the Paris Agreement target of keeping the rise in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the increase to 1.5 °C. Among other things, tackling this dire situation will necessitate all forms of finance to be

redirected and aligned with the Paris Agreement to fund extraordinary levels of public and private investment in alternative infrastructure in advanced and developing nations.

The transformational change needs to be immediate. The investment in new LCCR infrastructure is far beyond what public finance can meet based on current levels of taxation, and private investment is not flowing at the scale or speed required to support the transformation. Private investors have failed to provide stable and sufficient levels of long-term, affordable financing. Evidence over the past 15 years

Figure 4 Investment in infrastructure projects with private participation, 2010–2017



Source: Saha et al. (2019)

suggests that upper- and lower-middle-income countries are most susceptible to volatility in investor flows, while low-income countries (LICs) clearly suffer from insufficient flows (see Figure 4). These issues have recently been exacerbated by the introduction of tougher global financial regulation, such as Basel III, which has disincentivised long-term lending by commercial banks (Financial Stability Board, 2013). There is much academic literature on this failure¹⁶ (see Box 1), the best-known focusing on market failures in the private financial sector due to asymmetries of information (Stiglitz and Weiss, 1981; Stiglitz, 1994) and the existence of externalities (environmental, for example), which are not reflected in market prices. This has resulted in the under-provision of private investment in public goods (such as LCCR investment) and over-investment in public bads (such as carbon-intensive technologies and infrastructure).

At a practical level, the task of financing infrastructure of any type (but especially LCCR infrastructure) is particularly challenging, as it requires large initial investments, which tend to soak up most of a project's costs. In most cases, these types of project require long-maturity financing to match the long payback period over which they become commercially viable. In many developing economies, with shallow, nascent capital markets, this long-maturity debt or equity is simply unavailable, or, if available, extremely costly. Moreover, commercial viability is inextricably linked to technological risks if new technologies are being introduced or existing technologies are being adapted to different natural conditions. Commercial viability is also tied to project revenue generation (such as user charges) – an element that is susceptible to political risk, as there may be changes to government policy over a long period of time. Lastly, there can be significant externalities, such as decreasing carbon emissions, which may not, or not yet, be reflected in market prices.

NDBs are well placed to overcome this financing constraint. Indeed, the failure of private financial markets to independently

Box 1 Market failure and NDBs: the theoretical basis for NDB intervention

Development banks can help overcome three major market failures simultaneously. The first kind are market failures or gaps associated with the asymmetries of information particularly prevalent in financial markets (Stiglitz, 1994). These asymmetries imply that government interventions, such as the existence of good NDBs, are justified because government failures are smaller than market failures. The supply of long-term finance at a reasonable cost for projects that are key to achieving important structural transformation is a public good rarely forthcoming from private investors.

Second, there are market failures that occur in knowledge and information markets (Stiglitz and Greenwald, 2014). Governments have a clear role in promoting a learning society. Good NDBs are an institutional vehicle for helping to achieve this. Because of their long-term view, NDBs can and do help fund, accumulate and coordinate expertise in specific areas of innovation and can be crucial to the application of such innovation to projects.

A third market failure overcome by the involvement of development banks relates to externalities. Private actors are unable to take environmental externalities into account and incorporate them into their investment decisions, as they are not reflected in market prices. Purely private actors, alone, cannot quickly undertake the kinds of investments that can be delivered with the participation of NDBs.

deliver adequate, stable funding in sufficient maturities at reasonable cost in local currencies has led many governments to rely more on NDBs. Thanks to their funding models, they can finance over longer periods at a relatively lower

16 See Griffith-Jones et al. (2018b) and Schclarek et al. (2019) for further discussion and an overview of the academic literature.

cost compared with the market. In its survey of NDBs, the World Bank reported that 85% of respondents indicated they could borrow from international capital markets or institutional investors (de Luna-Martinez et al., 2018). These borrowings from capital markets are at or below-market interest rates and have maturities beyond what similar private institutions can access (sometimes facilitated by an explicit sovereign guarantee). Some NDBs also have access to government fiscal support. They can then pass these concessions on to projects and programmes through their financing. For many NDBs, the ability to access and raise capital beyond government fiscal support is closely tied to their creditworthiness and that of their government.

Consequently, NDBs have strong comparative advantages when it comes to performing five key catalytic roles in supporting the transition to an LCCR economy:

1. as financiers of LCCR infrastructure at both concessional and non-concessional rates of finance
2. as mobilisers of external resources, either private or public
3. as intermediaries in blending climate finance and development finance from MDBs, RDBs, DFIs, climate funds and donor agencies with their own resources to help mobilise and scale up private investment in LCCR infrastructure
4. as policy influencers helping shape broad and specific policy frameworks to incentivise and channel private investment to LCCR infrastructure
5. developing a pipeline of and/or investing in demonstration projects that show private banks and investors the commercial viability of new technologies and sectors (Morgado et al., 2019; OECD, 2018; Griffith-Jones et al., 2018a).

These roles are not mutually exclusive. The observed transition that emerges from our research and interviews is one where NDBs focus relatively less on their role as financiers and more on their role as dynamic mobilisers and facilitators (see Box 4). NDBs acting as policy leaders and innovators to the greatest extent feasible will accelerate these mobilisation and

realignment efforts. The shift in emphasis in NDBs' role necessarily raises the issue of how to measure performance and how to build an accountability framework for this new role. This process may encounter methodological difficulties and require evaluations to be more qualitative than quantitative. This issue has been identified as an area for future research and is discussed further in Section 6.

In discussing the aforementioned roles in more detail, we combine roles 2, 3 and 5, above, as they are closely interlinked.

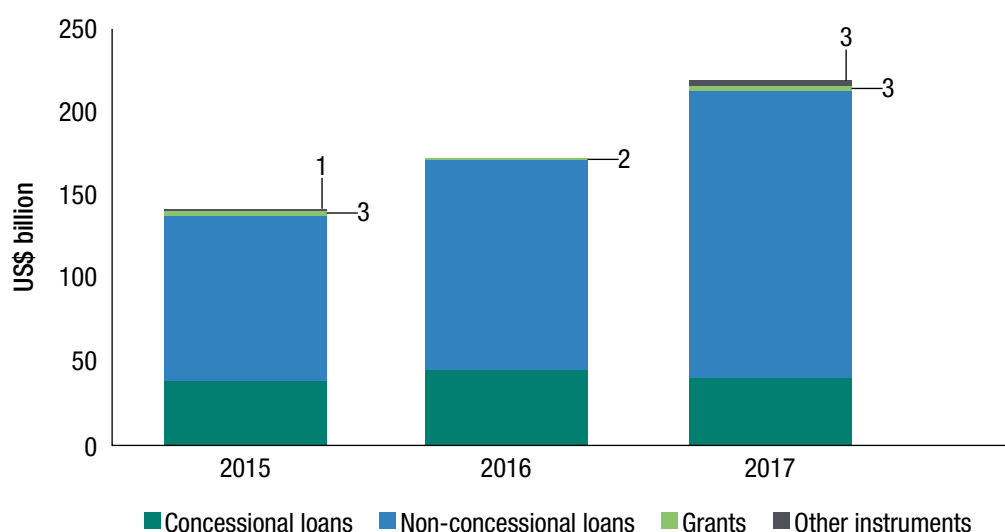
3.2 NDBs as traditional financiers of infrastructure investment

Historically, NDBs have played important roles in supporting their domestic economies. Although the modalities of this support have varied by country, mandate and the needs of the domestic economy, NDBs have mostly served to provide loans to mandate-aligned projects. In this section, we focus on infrastructure financing operations. To illustrate the importance of NDB lending operations, as per the IDFC's most recent mapping of green investments by its members, non-concessional loans make up over 81% of their green financing, with concessional loans accounting for 17% (IDFC, 2018) (see Figure 5).

Direct lending or financing tends to be fairly simple (plain-vanilla loans) and is well suited to the construction and operational phase of infrastructure projects, as the NDB takes on some or all of the project's credit risk. In these cases, the NDB acts like a commercial bank, extending credit directly to a project or company. These types of loan offer both the lender and borrower the ability to match potential revenues to loan repayments after the initial outlay. If NDBs co-finance infrastructure projects with other lenders, public or private, they increase the financial leverage of their funds and potentially get more development impact for each dollar they invest. NDBs can also introduce innovation in their lending to share risk, maximise development impact and also serve broader policy objectives (see Box 2).

NDBs' long-term finance through direct loans can be senior debt that is *pari passu* with other lenders, or subordinated debt that puts

Figure 5 International Development Finance Club member share of green finance commitments by instrument, 2015–2017



Source: IDFC (2018)

Box 2 Innovative direct loan repayments in South Africa

In their work on African development banks, Bradlow and Humphrey (2016) highlight the ways in which the DBSA and Industrial Development Corporation (IDC) are incorporating community trusts into their lending operations to extend the impact of South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPP). Under the scheme, communities where DBSA or IDC-financed renewable energy projects are planned create a trust. In addition to financing the project, the DBSA or IDC provides a loan to the community trust so that it can buy an equity stake in the project. The loan is repaid by the community trust from the power facility's dividends – a process made possible by the development banks' willingness to extend a grace period on loan repayments until the project is operational. While the scheme means the DBSA and IDC must continue to carry the loans on their balance sheets, it does allow them to share the risk of lower revenues or project failure with the communities in question – outcomes the NDBs try to avoid with stringent due diligence from the outset.

NDBs in the position of secondary creditor. This subordinated role is often used to mobilise further investment from other partners. By taking a subordinate role, NDBs leverage their greater willingness to face potential losses in the pursuit of development outcomes. However, care must be taken to avoid excessive contingent liabilities. To leverage their unique capital, NDBs can also blend their concessional funding (grant or low-interest loans) from international partners to make the terms more attractive to co-financiers. Concessional or not, NDBs taking a subordinated role in a loan structure demonstrates the overlap between NDBs acting as both financier and mobiliser.

Direct lending also enables NDBs to steer policy. For the transition to LCCR, loans to certain sectors and projects are a valuable instrument for implementing the Nationally Determined Contributions (NDCs) defined in the Paris Agreement and, more broadly, national development plans.

Intermediated or indirect loans are another element of NDB operations, where the NDB lends to a financial intermediary, typically a commercial bank, for onward lending. These loans can be instrumental in financing the construction and operational phases of infrastructure projects. The NDB takes on the credit risk of the financial intermediary and the intermediary assumes the credit risk of the project.

Box 3 Innovative intermediated loans in South America

Since 2008, Corporación de Fomento de la Producción (CORFO) of Chile has worked with KfW to provide long-term concessional funding to Chile's commercial financiers for onward lending to non-conventional renewable energy projects. The funds made available have had high levels of concessionality, with an average interest rate of 4.3% and an average tenor of 12 years. Despite these attractive terms, the OECD (2016) has reported that only two of the country's 23 commercial banks participated in the programme. Still, 15 projects received support worth a total \$140 million and the programme provided evidence of viable renewable energy investments. In 2016, one-third of banks operating in Chile were actively involved in financing renewable projects (Violic, 2015).

In Peru, Corporación Financiera de Desarrollo (COFIDE) provided funds to local financial institutions to lend on for taxis and buses that had been converted to natural gas and therefore had lower carbon emissions. Local gas stations collected the loan repayments at the pump. COFIDE provided the Tier 2 loans at concessional rates to participating banks, along with the technology platform to make it work. A major advantage of the programme was that it gave access to credit to large numbers of taxi drivers who traditionally did not have it (Smallridge et al., 2012).

As with direct lending, NDBs can blend their own resources with concessional funds obtained from governments or international public partners to improve the terms and conditions of their financing, once again demonstrating the overlap in their roles of financier and mobiliser. It should be emphasised that the lower interest costs of intermediated loans provided by NDBs do not necessarily mean that NDBs are subsidising financial intermediaries. By passing on some or all of their reduced borrowing costs to commercial lenders, the NDBs expect end-borrowers to get their loans from those lenders at lower-than-market rates. It is important that NDBs monitor these transactions to ensure this bears out in practice and that the financial intermediaries pass on the cost advantage to the ultimate borrowers/investors.

NDBs are increasingly lending via indirect loans. However, lending to big infrastructure projects, including LCCR ones, tends to be direct. This enables them to clearly steer policy, such as towards low-carbon projects (Griffith-Jones et al., 2018a).

3.3 NDBs as blenders and dynamic mobilisers

NDBs will potentially have a particularly significant impact on the transition to an LCCR economy as mobilisers and facilitators of private investment and external resources. Well-run NDBs are able to tap local sources of capital, especially in high-income and some middle-income countries, and bring in-depth knowledge of their countries' development needs, coupled with vast experience in long-term investment financing. This gives them the in-house competencies required to take a leading role in scaling up and realigning international and national private finance for LCCR infrastructure investment (Smallridge et al., 2012). However, there are limits, both to the level of public resources that can be leveraged, especially in the poorest countries, and to monitoring the effective channelling of these resources to help meet the SDGs.

With the plethora of programmes and financial instruments available to NDBs, this report outlines some of the most common and innovative tools and instruments that NDBs have employed to mobilise capital during the pre-construction, construction and operational phases of infrastructure projects (see Box 3). Each stage requires different instruments and

involves different sources of finance. These tools can and should be adapted to LCCR infrastructure, if they have not been already.

3.3.1 Pre-construction phase

To mobilise private and external investment to LCCR infrastructure, entities need to have tangible, bankable projects in which to invest. Building a project pipeline and ensuring bankability is a key first step in the construction process and a crucial hurdle to further investment. This area was a recurring theme in our interviews and features prominently in recent literature. While this theme is highly important in and of itself, our interviews revealed that a bankable project pipeline can also facilitate access to international climate funds, such as the GCF, as it is deemed beneficial to accreditation.

Recognising this need, NDBs provide grants and technical assistance to fund multiple activities. Some NDBs, in the case of grant-funded feasibility studies, structure the grant so that it is reimbursable if the project goes ahead and is successful. DBSA and Mexico's Nacional Financiera (NAFIN) are two institutions that employ recoverable grants or grants that are convertible to loans (author interviews, 2019). One of the key challenges is to not just develop a pipeline of good individual projects, but to try to develop scalable projects (author interviews, 2019). This is not just technologically relevant, but necessary to attract large institutional investment later in the project cycle when the LCCR infrastructure is operational, such as through securitisation.

NDBs have created project preparation facilities to ensure bankability. DBSA, for instance, has created its Project Preparation Fund, earmarked for projects the bank's financing divisions can include in its pipeline. The funds are to be used to build an enabling environment for infrastructure project implementation, to conduct pre-feasibility and bankable feasibility studies and to assist with costs to reach financial close (DBSA, 2013). The aim is that these projects will then be funded by DBSA's lending divisions.

DBSA is also the implementing agent for the Infrastructure Investment Programme for South Africa, a project preparation facility for the named country and its neighbours, funded

Box 4 Development Bank of South Africa – from financier to mobiliser

As documented by Morgado et al. (2019), DBSA has recognised the importance of the private sector if South Africa is to scale up its investment in climate-compatible infrastructure and reach its climate goals. DBSA departs from other NDBs in its transparency in recognising this and how it has implemented this reality into its operations. In 2016, DBSA reduced its disbursement targets and introduced corporate target amounts to be catalysed by its investments. It has established concrete targets to be crowded-in from third parties and now lists 'mobilisation' ahead of 'amounts disbursed' on its corporate scorecard.

One initiative that will aid the pursuit of mobilisation is the DBSA Climate Finance Facility (CFF). The facility, set up with funds from DBSA (\$55 million), the GCF (\$55 million) and other DFIs (\$59 million), will supply a range of credit-enhancement mechanisms, such as subordination, first loss or tenor extension, to local commercial banks with whom it participates in co-financing arrangements. The CFF will be structured as a special window within DBSA and will have its own operations and balance sheet. By working with local commercial banks, DBSA expects CFF funds to be blended for investment in smaller projects, creating a demonstration effect and greater awareness of the positive returns of climate projects available to commercial banks (Morgado et al., 2019).

by European Union (EU) grants, together with loans from DBSA, KfW, EIB and AFD. It also acts as administrator of the South African Development Community Project Preparation and Development Facility funded by the EU and KfW. Similarly, Brazil's National Bank for Economic and Social Development (BNDES) has an infrastructure project fund, which provides funding for technical studies associated

with the preparation of infrastructure projects. It also funds research on economic and social development that may guide public policy formulation in Brazil (BNDES, n.d.).

Another important source of project preparation finance that NDBs can offer their clients is provided by the MDBs, RDBs, DFIs and international climate funds. There are a variety of funds that project developers and their banks can access to conduct many of the aforementioned activities. Notably, the GCF's project preparation facility can provide up to \$1.5 million per project or programme request made by an accredited entity (GCF, 2019d). These funds can be used for pre-feasibility and feasibility studies, project design, environmental, social and gender studies, risk assessments, and various other activities. Becoming an accredited entity is a hurdle for NDBs, which we will discuss later. However, if this hurdle can be overcome, smaller NDBs can use the facility to establish a pipeline of projects for investors. Indeed, it may be wisest for smaller NDBs to invest their efforts and limited resources in building such a pipeline rather than investing in projects themselves, being both strategic and catalytic in their operation. Either way, such bankable projects are the first step towards achieving the infrastructure needed to transition to an LCCR economy.

3.3.2 Construction phase

In the construction phase, NDBs can provide a combination of financial instruments, including the aforementioned concessional loans, to facilitate the private and external financing of projects. NDBs – often in collaboration with private lenders, investors, governments, international institutions and/or donors – can blend their own resources with concessional ones from their governments and international sources of public financing to improve the terms and conditions of their funding and thus entice private investment (see Box 5). They can also coordinate different economic actors, from governments to private lenders and investors, as they have privileged access to them. It is important that the range of instruments used is broad and suited to a country's level of development and consistent with the depth

of its capital markets. While introducing new instruments is valuable, so is relying on well-tested, effective mechanisms.

Grants

Ensuring that international (and national) grant resources are effectively channelled to maximise development impact and contribute to the achievement of the SDGs is a key challenge. This includes, but is not restricted to, maximising the leverage of private lending and investing. Closely linked to this is how to make sure that grants to private intermediaries and investors are effectively used to ensure clear additional SDG impacts, especially on climate-change mitigation and adaptation, and avoidance of moral hazards. These important issues are beyond the scope of this report, but could be explored in future research, as suggested in chapter 6.

While grants do not account for a large percentage of NDB operations, they can be used to lower the interest rate of NDB loans, especially on projects that are not yet commercially viable which have significant externalities, such as LCCR-compatible investment (IDFC, 2019). It is important that such subsidies are transparent, clearly targeted and sometimes temporary, if the effects of the externality declines over time (for example, if a cheaper technology is developed that makes the original project commercially unviable).

This subsidised NDB lending can be combined with commercial credit (co-financing), both for NDB loans channelled directly to support projects or programmes and for NDB loans on-lent through commercial banks. Grants can also be used to fund high-risk research and development that has the potential for high social returns or the potential for long-term large commercial impact. For example, CORFO has created an institute for funding technology research for green mining (author interview, 2019). We discuss this example more in sub-section 3.4.4.

Another use of grants is to give guarantees against first losses or particular types of risk, such as cost overruns or, more typically, lower-than-expected revenues during the operational phase. Furthermore, grants or concessional finance can be used for tenor extension,

Box 5 SDG Indonesia One

In October 2018, the Government of Indonesia, through the Ministry of Finance and PT SMI, created SDG Indonesia One, a platform comprising four distinct facilities and funds to channel resources to projects that support the achievement of the SDGs. The facilities and funds are tailored to donor and investor appetite. This specifically covers development facilities, de-risking and financing, and an equity fund (PT SMI, n.d.).

The platform is designed to ensure the development of the infrastructure sector from end to end. The development facilities, for example, are aimed at encouraging the preparation of infrastructure projects both at the national and regional government level. The de-risking facilities aim to increase the bankability of infrastructure projects to make them attractive to the private sector. The financing facilities aim to encourage and stimulate greater infrastructure financing. The equity fund is intended to encourage the participation of private investors in infrastructure projects, to strengthen capital capacity for new (greenfield) projects and to act as an asset recycler for projects that are already operational (brownfield).

In December 2018, PT SMI had raised \$2.46 billion for the four facilities and funds from 25 different partners, including donors such as AFD, the Canadian government and the United States Agency for International Development (USAID); DFIs such as the Netherlands Development Finance Company (FMO) and the Danish Development Finance Institution (IFU); commercial banks, such as Standard Chartered and the United Overseas Bank; and multinational project developers, such as China Communications Construction and ENGIE (PT SMI, 2019).

especially in light of post-2008 Basel banking regulatory changes, which discourage long-tenor commercial bank debt. With longer tenors and correspondingly longer payback periods, infrastructure projects have a better chance of being launched and becoming successful (author interviews, 2019).

It is easier for NDBs than commercial banks to combine loans or guarantees with subsidies, as they are closer to policy-makers, who can better help design and monitor such schemes if they are channelled via NDBs.

Lastly, grants can be used to provide project equity.

Equity

Some NDBs have a mandate to provide equity. They invest in technology companies and projects directly or via private equity and venture capital funds.

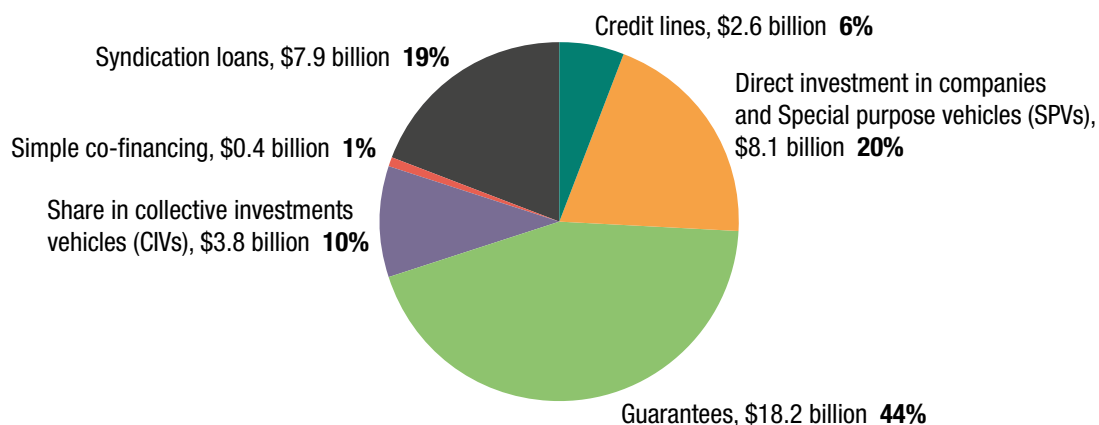
NDBs can be in a first-loss position (junior equity) in relation to other investors (senior/normal equity) or they can invest alongside other investors (normal equity). Some NDBs, such as Banque Publique d'Investissement (BPI France), CORFO and Colombia's Bancóldex, invest indirectly by investing in or creating private equity or venture capital funds rather than investing directly in companies or projects. Direct investment seems to be a growing trend. Often, the NDB investment catalyses additional local and international private capital.

Equity investment means the NDB is able to capture the upside potential of any project, although it is riskier. These profits can help finance further NDB investments, as they add to retained earnings. Furthermore, taking equity positions, especially directly in specific companies, may increase an NDB's influence, encouraging a company to respond to government priorities, especially the needs of the LCCR transition.

Guarantees

In its survey on green finance, IDFC (2018) reported that the commitments made by its members to green energy and the mitigation of greenhouse gases in 2017 came from the following: 81% from loans, 17% from grants and less than 1% from guarantees. What is

Figure 6 Amounts mobilised to the energy sector, 2012–2017



Source: Sangare and Hos (2019)

striking is the limited use of guarantees, despite their leverage potential. Sangare and Hos (2019), for instance, report that 44% of the \$41 billion mobilised in the energy sector between 2012 and 2017 was in the form of guarantees (Figure 6). So, while effective, NDBs are not availing of guarantees as a tool. This may be because they have disadvantages, as well as being complex to set up and monitor.

Guarantees involve an NDB providing credit enhancement to a financial intermediary that is providing a loan to project or programme. The NDB assumes some or all of the project's credit risk, which might otherwise dissuade lenders.

There are different types of guarantee, but those related to credit risk are the simplest. Traditional credit guarantees provide assurance to third-party lenders that principal and interest will be paid when due in the event that the borrower is unable or unwilling to pay. Such guarantees normally cover less than 100% of the borrower's payment obligations. Full credit guarantees can cover up to 95% of payment obligations, while partial credit guarantees typically cover far less.

There appears to be a growing trend among some NDBs, most notably in Latin America, to opt for guarantees rather than direct or indirect lending. CORFO and Mexico's NAFIN are leaders in this respect, with NAFIN seeing guarantees as a share of total operations increase dramatically (Griffith-Jones et al., 2018a). The trend is not universal, however; guarantees only form a small part of DBSA's operations,

for example. It will only provide 18–24-month project construction guarantees to cover building risk. These are used in concert with guarantees from RDBs, such as the AfDB, which provide the bulk of construction risk guarantees. However, as DBSA's investments in renewable energy projects increase, staff believe more guarantees may be used (author interview, 2019).

While the mobilisation of private capital via mechanisms such as guarantees may, and often does, bring benefits of additional leverage, it also generates risks in the form of contingent liabilities that need to be properly accounted and sufficiently provisioned for. There is also a risk that growing loan volumes and more indirect operations will make it harder for NDBs to impose conditions. This principal-agent issue is particularly problematic if the NDB is tasked with implementing national development strategies or projects to transition to an LCCR economy: goals that may or may not fall under a private capital provider's mandate.

Other instruments

Certain instruments combine different sub-instruments to help catalyse private finance. In Box 4, we cite the example of the Climate Finance Facility (CFF), created by DBSA to promote LCCR infrastructure with DBSA and GCF financing – the first scheme of its kind on the African continent. CFF aims to crowd in private finance by improving the risk–return profile in the local currency of LCCR projects that cannot get finance in the market.

3.3.3 Operational phase

Similar instruments are used in the operational phase. In general, investment risks are lower during this phase and there is greater potential to attract additional lenders and/or investors. There are, in fact, institutions that specialise in funding projects once they are up and running and that focus on crowding in institutional investors – the Indian National Investment and Infrastructure Fund (NIIF) being a prime example (see Box 6). This is usually done through take-out finance agreements where NDBs or similar institutions provide long-term financing to a project to replace previous financing that might have been provided by commercial banks and/or another NDB. This transaction frees up the previous lender's capital for investment in other projects.

Many NDBs provide long-term loans and keep them on their balance sheets until the very end of the term. It could be argued, however, that NDBs provide most of their value to a transaction at the front end of a loan, during the pre-investment and construction stages. Thereafter, NDBs may add less value. This would potentially underpin the case for using securitisation: grouping assets with lower risk than in the earlier stages and selling off tranches to private investors. This suggests such lenders should not lend or invest together, but sequentially (author interviews, 2019). This would allow capital to be recycled and support local capital-market development. In the post-construction phase, the risk is significantly lower and the asset is generating revenue. The approach would involve pooling and transferring LCCR infrastructure assets into an SPV to diversify risk and achieve scale. The SPV would then sell the associated pooled revenue cash flows by issuing securities (such as bonds) in tranches, releasing capital for the NDB to reinvest.

These instruments are potentially interesting, as they would meet the need of institutional investors to finance already-built, revenue-generating projects that generate long-term cash flows to match their long-term liabilities, thus potentially attracting significant additional and long-term finance into LCCR infrastructure. They could even package revenue streams from the NDBs of different countries, offering

Box 6 National Investment and Infrastructure Fund (NIIF) of India

In 2015, the Government of India created the NIIF as an investor-owned fund manager, underpinned by government investment. The NIIF has three funds: a master fund, a fund of funds and a strategic fund. Each has its own distinct investment strategy.

The master fund focuses on creating sectoral platforms. Its first is a \$3 billion fund dedicated to ports and logistics, which it co-founded with Hindustan Infralog Private Limited in partnership with DP World.

The fund of funds invests in third-party managers, which then invest in various infrastructure services and allied sectors (traditional infrastructure, green energy, social infrastructure, manufacturing and services), using diverse products (equity, mezzanine, debt) and investment styles (early stage, growth and control).

The strategic fund is 'aimed at growth and development stage investments in projects/companies in a broad range of sectors that are of economic and commercial importance' (NIIF, 2018).

In 2018, NIIF acquired IDFCs infrastructure debt fund, a loan book worth around \$650 million, which had lent to operating infrastructure projects, helping original project financiers to recycle their capital following the start of operations (Ray, 2018).

In 2019, the State Bank of India, India's largest lender, and NIIF signed a memorandum of understanding to collaborate on equity investments, project funding, bond financing, renewable energy support and take-out finance for operating assets (NIIF, 2019).

diversification benefits. However, they need to be structured very carefully, so as not to lead to excessive NDB risk-taking in the initial phase (as they are ultimately funded by governments

and taxpayers) or excessive profits for private investors.

Although this technique is not particularly prevalent in development banking to date, there are a few examples where it has been used, such as AfDB's recent 'Room2Run' transaction, which is a synthetic securitisation. BNDES also created the Sustainable Energy Fund in 2017 to support the development of the green bond market, expand the LCCR infrastructure investor base and increase liquidity of infrastructure securities in Brazil (BNDES, 2016). The fund is set up in such a way that BNDES finances the construction phase of the LCCR infrastructure project, then securitises the operational phase (Morgado et al., 2019). BNDES took an equity stake of around \$144 million in the fund and hopes it will issue bonds worth \$1 billion or so in its first 18 months of operation. Since its launch, it has secured the investment of '11 institutional investors, allowing BNDES to limit its capital allocation to the fund to 43%' (Morgado et al., 2019: 36).

3.4 NDBs as green investment-policy influencers and investment innovators

As NDBs transition from their traditional role of financier to that of dynamic mobilisers, they are simultaneously garnering greater influence in national and international policy circles. While we discuss later how NDBs can capitalise on this influence in the transition to an LCCR economy, it is important to acknowledge that the process is already underway. Many NDBs are already green investment leaders in their own economies, issuing green bonds to expand sustainable portfolios, advocating for further green investment and alignment with the Paris Agreement, and are at the forefront of innovative LCCR investment.

3.4.1 NDBs as green leaders

The two globally largest NDBs are among the most prominent supporters of major new LCCR energy technologies, especially solar power. In Germany, KfW was initially the sole lender to private companies investing in solar energy. By demonstrating that these technologies were commercially viable, KfW was able to catalyse private bank investment (Griffith-Jones, 2016). Moslener et al. (2018) detail how KfW has met challenges associated with Germany's shift to a green economy (the energy transition) through its broad economic objectives (which include supplying public goods, such as environmentally beneficial investment), government financing of its capital, its proximity to policy-makers and its extensive technical expertise. This expertise is not just in finance but, equally in specific sectors and technologies – deep expertise that many commercial banks do not have.

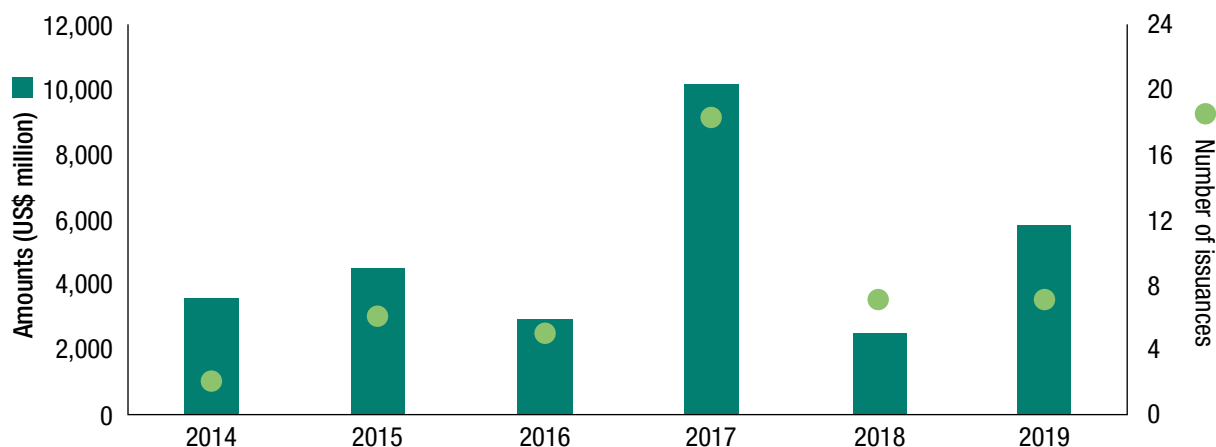
In China, CDB has helped to design policies to encourage investment in renewable energy, particularly solar, and provided significant initial funding. As a result, Germany and China have been influential early global promoters of solar power, helping to develop the technology and make it increasingly cost-competitive relative to fossil-fuel energy, not just in their own countries, but around the world. In both cases, the NDBs played crucial roles in promoting the importance of new technology, helping their governments design appropriate policies to facilitate investment and make it commercially viable and provide initial finance at significant scale to foster significant, timely investment. This clearly illustrates the type of valuable contribution NDBs can make to finance the transition to an LCCR economy.

3.4.2 NDBs as issuers of green bonds

NDBs can encourage investors to participate in green projects by issuing green bonds, which also helps to develop local capital markets. As we can see from Figure 7, the number of bond issues by NDBs¹⁷ and the proceeds of those issues in dollar

17 Information on green bonds has been provided by the Climate Bonds Initiative (CBI). This has offered information on green bond issuance by all of the institutions it classified as NDBs from 2014 to 2019. CBI has only included green debt instruments whose use of proceeds has complied with the categories listed under its Climate Bonds Taxonomy. CBI's database lists 12 NDBs as issuing green bonds. It is possible that issuance captured by CBI has included refinancing.

Figure 7 Total issuance by national development banks, 2014–2019



Source: CBI (2019)

terms have been fairly steady over the past six years, with the exception of 2017, when CDB issued eight green bonds worth \$4.6 billion.¹⁸ Otherwise, most of the green bonds have been issued by KfW (CBI, 2019)¹⁹ (see Figure 8).

Any further increase in the number of green bond issues is likely to stem from the larger NDBs, as issuers of green bonds experience similar challenges to those faced by all infrastructure investors. In their report on green bonds, Cochu et al. (2016) note that green bond issuance is undermined by a lack of green projects that are bankable or in need of financing or refinancing. Also, issuance is constrained by a lack of mechanisms and capacity to aggregate smaller projects to justify larger issuance.

While evidence is anecdotal, oversubscription to green bond offerings is common, as they are usually issued by well-established companies or governments, echoing the dynamics seen when these entities issue regular bonds (Weber and Saravade, 2019). These supply issues, combined with the inability of some NDBs to get a good credit rating to issue debt on the capital markets, act as impediments to increasing green bond issuance by many NDBs. Moreover, this

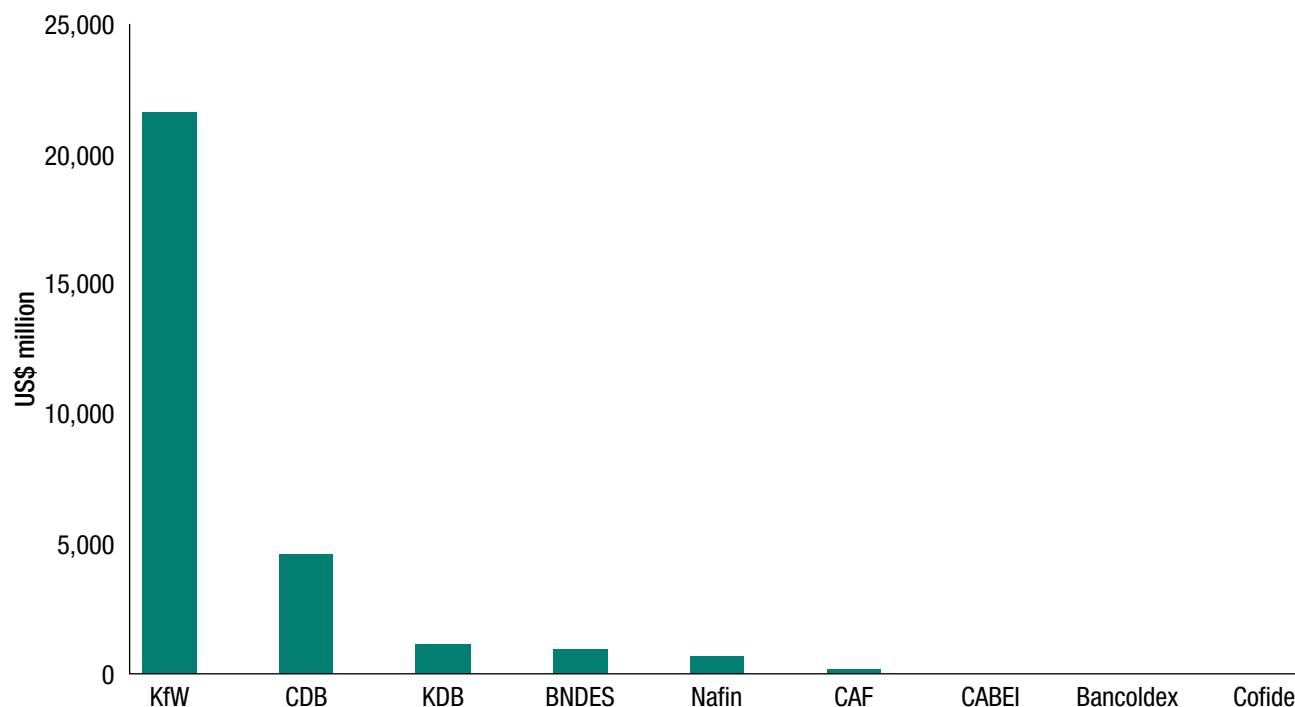
imbalance of supply and demand demarcates a clear path where NDBs could help build a pipeline of green projects, aggregate them and issue green bonds to finance their continued development and/or operation. While this is probably a more attractive and feasible option for larger NDBs, smaller ones could collaborate on aggregate regional projects, perhaps diversifying country and currency risk, thereby making an issue more attractive to investors.

In terms of KfW bond issuance up to 2016, there is mixed evidence as to whether issuing green bonds gave the bank lower coupon payments, currency flexibility or issuance size (KfW, 2016). The green bonds issued by KfW were similar in structure to its non-green issuance, corroborating what World Bank officials have noted, that green bonds are not actually cheaper and may have the unintended consequence of limiting issuer flexibility (Giugale, 2018). Consequently, it may be advisable for smaller NDBs (most of them) to issue traditional bonds to fulfil a green mandate rather than smaller green bonds with higher transaction costs for the same purpose. This is an area that seems to require further research.

18 Two of the eight green bonds issued by CDB were international green bonds. One was a five-year \$500 million bond and the other was a four-year €1 billion bond (CDB, 2018).

19 KfW accounted for almost 68% of green bond volumes from NDBs between 2014 and 2019 and 49% of overall green bond issuance during that period (CBI, 2019).

Figure 8 Total national development bank issuance in 2014–2019, by development bank



Source: CBI (2019)

3.4.3 NDBs as green investment advocates

NDBs have a significant role to play in the dissemination of knowledge on climate finance; they can learn lessons from similar institutions and assist smaller institutions that may not have the required internal capacity. For example, DBSA management is actively engaged with other NDBs in southern Africa to build their capacities to support green investment (author interviews, 2019). Many NDBs are also quite involved in wider organisations, such as IDFC, or regional national development bank associations, such as the Association of Development Financing Institutions in Asia and the Pacific (ADFIAP), the AADFI and the Latin American Association of Development Finance Institutions (ALIDE). This sometimes leads to financial relationships, but can also lead to technical assistance and advice. For example, AADFI has worked with member institutions to improve the bankability of their projects and has developed a toolkit that allows members to assess governance best practices (see section 4.1 on Good governance).

One such policy tool that could be disseminated among NDBs and be effective

in the transition to an LCCR economy is the shadow pricing of carbon emissions during pre-investment project evaluation. This methodology has been extensively used by the EIB since the mid-1990s (see Box 7) and more recently adopted by the World Bank. While there seems to be a strong case for NDBs embracing such methodology, none of the NDBs and experts we interviewed were yet using it for evaluation (author interviews, 2019).

The use of shadow carbon pricing by NDBs would appear to be a useful and necessary tool, especially when renewables are not fully commercially attractive, as is still the case in many countries and for various technologies. Where shadow carbon pricing is not enough to restrict the use of fossil fuels, limits or a ban on lending by NDBs for new fossil-fuel plants may be called for (like KfW and, more recently, the EIB). The use of shadow carbon pricing, regulations and/or restrictions on lending by NDBs also needs to be supported by clear government mandates, as for Germany's KfW (author interviews, 2019). Trade-offs may need to be considered for very poor countries or

regions where, for example, fossil fuel is the only source of energy or the cheapest option by some margin. In such cases, it may be necessary for the international community to subsidise the use of low-carbon fuel, so that the transition to non-fossil fuel is just and fair and does not place

an overwhelming burden on poor people or governments.

Furthermore, the implementation of shadow carbon pricing could prove an important role for climate-finance funds. The CIF, GEF and GCF, as the largest multilateral climate funds,

Box 7 Shadow carbon pricing and the European Investment Bank's experience

The Stiglitz Stern Commission estimates that the explicit carbon price level consistent with achieving the Paris temperature target is at least \$40–\$80/tCO₂ by 2020 and \$50–\$100/tCO₂ by 2030, provided a supportive policy environment is in place (Carbon Pricing Leadership Coalition, 2017). It is encouraging that these shadow carbon price estimates are not very different to those used by the EIB. In 2017, for low, central and high price scenarios (in 2015 € prices), these were: €16/tCO₂e (\$19), €37/tCO₂e (\$44) and €62/tCO₂e (\$73). Furthermore, these will increase significantly by 2030. They are also relatively similar to the shadow prices the World Bank has started to apply more recently (European Investment Bank, 2015).

The EIB was the first development bank to use shadow carbon pricing in the mid-1990s. Its experience offers positive and negative lessons for NDBs. Because cost–benefit analysis ‘is in the EIB’s DNA’, it was a natural progression to incorporate the shadow price of carbon into its analysis. Doing so reduces the relative cost of renewables and penalizes carbon-intensive energy (author interviews, 2019).

In the 1990s, this raised two key questions for the EIB, however: (1) What is the right shadow carbon price to use? (2) What will the approach mean in practice for project evaluation and, in particular, the choice of projects to finance?

The EIB continues to calculate the shadow value of carbon by using a central estimate for the damage associated with an emission, plus a high and a low estimate. Annual ‘adders’ are applied to reflect a common finding that the marginal damage of emissions increases as a function of the atmospheric concentrations of carbon (European Investment Bank, 2013).

Regarding the impact this has had on the projects, EIB has chosen to finance, it has funded no new lignite projects in recent years. It approved its last coal project in 2006. In short, the approach has meant a major shift in EIB policy to renewable energy since the mid-2000s.

However, even with high carbon prices in the shadow carbon pricing approach, some high-carbon activities have proved borderline profitable for the EIB. To be able to reject them, in 2019, the EIB (2019) added an extra safeguard in the form of an emission performance standard (GHG emissions above 250g of CO₂ per kWh of electricity generated). As a result, borderline projects, such as coal, became ineligible. Thus, the cost–benefit analysis overlaid by an administrative restriction had even greater traction for the energy sector (author interviews, 2019).

We should emphasise that shadow carbon pricing is not a miracle mitigator of climate change; that may require a ban on the financing of new fossil-fuel plants. By not funding new fossil-fuel generating capacity, NDBs could prove an interesting means for governments dependent on fossil fuels to transition away from them. This is clearly more difficult for countries that have an abundance of fossil fuels or can buy them far more cheaply than renewables, especially less developed ones. There will need to be trade-offs in some cases: one drastic example is Mongolia, where people reportedly freeze in winter without heat, for which they mainly rely on coal-fuelled generation (author interviews, 2019).

could develop common methodologies for NDBs to evaluate projects, including shadow carbon prices. Using this methodology could be linked to the provision of finance, with more finance channelled to certain LCCR projects or even subsidies, when necessary (author interview, 2019). If the multilateral funds do not want to lead on this issue, major coordinating institutions, such as IDFC and/or the RDBs, could step in.

The introduction of shadow carbon pricing could be complemented by the adoption of other tools, such as the evaluation of physical and transition risk in NDB portfolios due to climate change and climate policy – an issue being increasingly discussed by central banks and financial regulators.

3.4.4 NDBs as innovators

NDBs have proven themselves to be market innovators and able to overcome the information asymmetries that undermine private investment. Private funders have difficulty investing in new technologies where risks are less known and payoffs are uncertain. For these types of investment, NDBs play an important role in fostering innovation and proving investment viability.

A good example is the involvement of development finance in Mexico's wind industry. During the global financial crisis of 2008, project developers in Mexico's nascent wind sector lost private financing due to banks' apprehension about supporting unproven business or product lines amid market turbulence and commercial investors' general lack of capacity to analyse and structure energy projects with an unfamiliar risk profile (BloombergNEF, 2019). The Inter-American Development Bank (IADB), the International Finance Corporation (IFC) and the Clean Technology Fund (CTF) worked with project developers to finish these projects, with the IADB and NAFIN channelling \$70 million of CTF funds to five wind projects and a utility-scale solar investment.

The concessional interest rates and long-term nature of the financing provided to these projects filled a significant gap in the market at the time and proved crucial in demonstrating the viability of Mexico's renewables market. Commercial investors accounted for 23% of the \$11.8 billion in new-build wind investment in Mexico between 2011 and 2017 while development banks accounted for 26% (BloombergNEF, 2019). Discussions with NAFIN suggest that it will scale back its involvement in the wind sector as commercial investors now have a better understanding of the market and its payoffs. As private finance normalises, NAFIN plans to turn its renewable-energy attentions to exploratory investments in geothermal and solar projects in the hope of creating a similar investment path for those technologies (author interview, 2019).

Meanwhile, to buttress Chile's work in renewables, CORFO is moving into 'green hydrogen', particularly in the copper-mining industry. In 2017, it invested \$5.9 million in an \$18.4 million technological consortium focused on developing a mining-truck prototype where 60–70% of the diesel is replaced by hydrogen. It has also supported the development of solar energy in the Atacama desert to help power the area's large copper mines (author interview, 2019).

CORFO is also the principal funder of another project exploring the use of hydrogen fuel cells in smaller machines (Litzbarski and Bischof, 2019). The former chief executive of CORFO told us that these technological consortia to develop new technologies were modelled after similar examples of government support in Finland and Israel and that using quasi-equity instruments to support new ventures had been important to technological developments (author interview, 2019).

CORFO has demonstrated that by working with local public and private actors, NDBs can use their experience, resources and convening power to fuel and bring such major initiatives to fruition.

4 Realising the potential of national development banks as key enablers

NDBs could undoubtedly play a major role in supporting the transition to an LCCR economy, as we discuss in chapter 3. From our research and interviews, it is evident that some NDBs are already engaged in various initiatives that are contributing to this transition, notably in renewable energy markets, the promotion of energy-efficient investments and the development of green technology.

The urgency of the climate crisis suggests NDBs need to do far more, however, including better understanding and management of the financial risks that climate change poses to their investment portfolios. Some are re-orientating

their focus accordingly, while some countries have created green investment banks (GIBs) – mostly advanced economies, such as Australia, Japan and the UK, but also a number of US states. Box 8 presents two studies exploring the issues governments should consider when deciding whether to ‘green’ an existing NDB or create a GIB.

Our research and interviews underscore the need to promote ‘good’ development banks and reveal a number of common bottlenecks holding them back. We therefore identify five interlinked prerequisites to NDBs reaching their potential as supporters of the transition to an LCCR

Box 8 Green an existing national development bank or create a new green investment bank?

In March 2019, delegations of senior finance and development policy officials from 21 emerging markets and developing countries attended the Green Bank Design Summit in Paris. Eleven of them indicated that they were within two years of launching a green bank, even though many already had an NDB (Green Bank Design Platform, 2019). So, what would prompt a country to create a new green bank rather than ‘green’ an existing NDB?

In its 2015 study of GIBs, the OECD noted that GIBs are characterised by a narrow mandate, largely to mobilise private LCCR investment through interventions to mitigate risk and enable transactions; their independent authority and degree of latitude in designing and implementing interventions; and their focus on cost-effectiveness and performance reporting (OECD, 2015b). These characteristics give GIBs greater flexibility to experiment, innovate and quickly adapt to the dynamics of market development.

In their research into whether governments should green their NDBs or create GIBs, Smallridge et al. (2019) provide a balanced analysis of the competencies and independence of existing NDBs. If an NDB has governance challenges and/or a mandate that is limited in scope, building a new bank may be more advantageous than attempting to overhaul the NDB’s structure. However, if the NDB is well established, has reliable systems in place, interacts with the relevant stakeholders and receives the required green mandate from the government, it is far more efficient to use the NDB structures already in place and avoid duplication.

economy, most of which are equally applicable to GIBs.²⁰ We discuss each in turn.

4.1 Good governance

A recurring theme throughout our research and interviews has been the importance of good governance. This underpins the willingness of shareholders to capitalise NDBs, the willingness of private actors, MDBs, RDBs, DFIs and international climate funds to engage and partner with them, and the inclination of domestic and international policy makers to engage, support and work with them. This is a challenge for NDBs, however, as they need to collaborate closely with government, private capital markets and companies, as well as international institutions, and help implement government policy while maintaining independence from vested public- and private-sector interests.

Features shared by the best-performing NDBs include a strong mandate, clear rules of cooperation with the private sector and some mutual understanding between the NDB and government on the expected return on capital (Rudolph, 2009). The best way to ensure such clarity is to have a qualified and empowered board of directors. Political appointments to a board do not make political capture a *fait accompli*, but they can help align government priorities with an NDB's operations. The desired outcome is a qualified board and staff that is adequately independent of narrow political and private interests, with a clear commitment to ensuring that the NDB contributes to the achievement of equitable and sustainable development.

Some NDBs are wrestling with past burdens, both real and perceived. Some of the literature suggests that state financial institutions (which would include NDBs) have tended to lack managerial skill, have mismanaged resources, been subject to political interference and been hampered by weak boards of directors (Ding, 2005). However, there are many NDBs that have avoided such pitfalls for much of their existence or were once mismanaged and have now turned

around. A good example of the latter is UDB (see Box 9).

Further research would be helpful, possibly with inputs from non-economists, on how to best ensure good governance. These could include in-depth case studies, both of NDBs that have been 'good' banks all or most of the time, and those that have turned from poor performers into fairly good ones, such as UDB.

Internal efforts by development banks can be supported by external stakeholders. AADFI, the regional association of African NDBs, has been working hard to promote good governance and support reform to strengthen the governance capacity of many African NDBs. As part of this endeavour, in collaboration with the AfDB and the World Bank, AADFI has developed the Prudential Standards, Guideline and Rating System (AADFI, 2019), based on the international financial and banking standards against which African NDBs assess themselves (see Box 10).

4.2 A clear mandate and a seat at the policy table

Effective management is very important. This intertwines with strong mandates in the planning and implementation stages of an NDB's mission. NDBs are integrated into the policy process of national governments to different degrees. How NDBs are involved in a government's climate and environmental planning is key to ascertaining how much influence an NDB will have on the transition to a LCCR economy.

Best practices have NDBs involved in the policy process, with clear lines of communication to government. This allows for greater alignment of policy priorities and NDB results. For better-performing NDBs, this evolves into a virtuous circle: the NDBs are clear on the policies and sectors being prioritised by government and can manage and deliver on government expectations, while governments view NDBs as facilitating their agenda and NDBs gain influence in government processes.

20 An exception to this is the need for a clear mandate. This is because GIBs are, by definition, development banks with a clear mandate to focus on LCCR investment.

Box 9 Uganda Development Bank: a case study in better governance and better policy integration

In 2014, under new leadership, the UDB adopted a more business-like model. According to our interviewees, non-performing loans, had previously made up 60% of the loan book and the UDB was undercapitalised by the Ugandan government (author interviews, 2019). The bank's new leadership recognised the need to be aligned with the government on policy and underpinned integration efforts with governance reform. The chief executive is now an active member of Uganda's President's Council, involved with the Uganda National Planning Authority and an integral part of developing Uganda's Vision 2040, which aims to bring the country to middle-income status over the next two decades (author interview, 2019).

To address the UDB's governance and management issues, its new chief engaged external consultants to identify ways the bank could improve its governance, structures and processes and establish best practices (author interview, 2019). The results led to a more focused management team that recognised the requirement to deliver results, particularly in relation to job creation (economy-wide, more specifically for women and youth), tax revenue and economic/private-sector growth.

UDB is 100% owned by the Ugandan government, but its commitment to strong governance has allowed it to operate at arm's length. UDB has prioritised operating as a business with strong corporate governance and proper risk management. Although the board of directors is appointed, there is a good separation of policy and business (author interview, 2019).

Consequently, UDB estimates that its non-performing loan ratio will sink below 8% of the loan book in 2019: a remarkable achievement in such a short space of time. As a sign of good faith, the Government of Uganda doubled its capital contribution to UDB in 2018. The bank has posted an average 3.9% return on equity over the past two years, suggesting that this faith is well placed (UDB, 2018).

Box 10 AADFI's Prudential Standards, Guidelines and Rating System

African development banks, on the whole, have been improving their governance structures. In 2008, the AADFI, the convening body of African DFIs, adopted the Prudential Standards, Guidelines and Rating System, formulated with the AfDB, with input from central banks, commercial banks, the World Bank and the International Monetary Fund (IMF). The system was designed to assist AADFI members in rating themselves in the three areas: governance guidelines, financial prudential standards and operational guidelines. These results are then shared by the AADFI (AADFI, 2019).

Of the 38 institutions that took part in the 2018 rating process, 25 (or more than 65% of participants) were deemed to be strongly compliant. This was a marked improvement on 2011, when just 10 of the 30 participants (33%) were considered to be strongly compliant. The areas in which AADFI members made the greatest gains during this period were management independence and incentives, management information systems and procedures, and liquidity (Yuma Morisho, 2011; 2018).

Many NDBs, including several IDFC members, told us they would welcome a clearer mandate or formal direction from their governments and noted the need for this mandate to remain stable over time, with built-in flexibility to respond

to changing priorities and changing needs in different phases of the development process (author interviews, 2019). Some NDB executives, for example, said they would like to stop financing coal-related investments and would

welcome a clearer mandate to finance green projects. The desire for a greater green focus must chime with NDBs' existing goals, which may include improving income distribution or empowering groups and communities previously underrepresented in the formal economy. With their local knowledge and international linkages, NDBs are well qualified to integrate even diverging government goals into their operations. Indeed, this would contribute to a more just transition to an LCCR economy.

Alongside domestic government direction, it is important that NDBs have international support. The international community acts as a feedback mechanism for domestic governments and shareholders, letting them know that their pursuit of LCCR outcomes is supported outside their borders and that empowering their NDBs with a clearer green mandate is considered a positive move. Engagement by and support from the international community can also help immunise NDBs from national political interference (author interviews, 2019). There is a delicate balance to be struck here, however: if the international community is deemed to be overly involved, this may limit an NDB's potential to shape national priorities and practices.

To ensure that NDBs coordinate and leverage their local knowledge and international linkages when it comes to domestic policy, governments should welcome NDBs to the national policy table. Several interviewees noted that NDBs' lack of integration into the policy process, at both the domestic and international level, had undermined their ability to be a key government partner in supporting the transition to an LCCR economy. While this lack of policy integration to date may partly reflect a history of poor governance, notably on the African continent (author interview, 2019), the situation is changing, as we discuss in Section 4.1 and as epitomised by UDB (see Box 9). Where governments have a clear development strategy and where NDBs are well governed, have clear mandates and participate in setting national goals, they have been able to help governments achieve their priorities by translating the goals into investment activities, as in the case of DBSA and UDB (author interview, 2019).

A seat at the policy table also helps boost NDBs' visibility. Evidence suggests that a lack of NDB visibility has been particularly problematic from an LCCR transition perspective. Few NDBs have had their role in the LCCR economy acknowledged in NDCs – a significant issue if NDBs are to be key mobilisers of finance for these development plans. Indeed, of the four NDBs we contacted, none had been included in the interim NDC document their country submitted to the NDC registry. This gap in the NDC process needs to be addressed. Governments should involve those NDBs that are well governed, are good performers and that support the LCCR agenda. These NDBs are well placed to assist their governments in preparing NDC plans and/or financial needs assessments.

Supportive government policy and regulatory frameworks are also key prerequisites. In Chile, for example, regulatory change that unbundled power purchasing agreements and reduced barriers to entry. This allowed renewable energy producers to enter the market (author interview, 2019). NDBs can contribute by helping to design constructive government policies and frameworks. DBSA, for example, has played a key advisory role in developing the South African Renewable Energy Independent Power Procurement Programme (REIPP) in partnership with the Department of Energy and the National Treasury. Since its launch in 2011, REIPP has seen five procurement rounds and bought 6,000 megawatts of renewable energy (GreenCape, 2016). Other instructive examples include KfW and CDB. KfW helped the German government design feed-in tariffs and other policies to support the development of renewable energy and energy efficiency (Griffith-Jones et al., 2018b; Moslener et al., 2018). China's CDB played a similar role in helping design government policy to promote the development of renewables.

4.3 Sufficient scale and the right modalities

Private investment in LCCR infrastructure is pro-cyclical, which is a challenge for all countries, but especially LICs. The perceived higher risk of projects in LICs is exacerbated

by longer payback periods. As shown by Tyson (2018), there was an increase in the private financing of infrastructure in LICs between 2008 and 2014, followed by a sharp fall. This volatility is nothing new for poorer countries, as private investment in infrastructure has historically been unreliable and volatile. More generally, the willingness of private finance to invest in infrastructure, especially in poorer countries, has decreased due to changes in Basel banking regulations, which discourages long-term commercial bank lending for financial-stability reasons (Financial Stability Board, 2018; Campiglio et al., 2018).

In this environment, the role of NDBs in directly financing and catalysing private finance for LCCR infrastructure is crucial. However, to accomplish this at sufficient scale, NDBs have to be fairly well capitalised. In Africa and Latin America, but also in other regions, most NDBs have fairly small capital bases, which constrains their lending capacity. For instance, the total loan portfolio of 19 African NDBs from which data was collected in 2015 was just \$20 billion – an average loan portfolio of just over \$1 billion (Bradlow and Humphrey, 2016). Furthermore, two-thirds of NDBs in Africa invested little to nothing in infrastructure (Bradlow and Humphrey, 2016). This binding capital constraint undermines the ability of NDBs to invest directly in and mobilise private finance for infrastructure, LCCR or otherwise.

An important precondition to NDBs playing a major role in financing LCCR infrastructure is therefore that they have large and strong capital bases that will allow them to have greater aggregate exposure to LCCR infrastructure and enable them to fund larger individual LCCR projects.

It is imperative that NDBs are able to leverage their capital by catalysing investment finance, not just from private and domestic investors, but also from other public investors, such as MDBs, RDBs, DFIs and international climate funds. NDBs will need to make themselves attractive partners and develop their local capital markets. Access to international climate finance will be key for smaller NDBs – especially in Africa – that operate in countries with shallow capital markets, where governments tend to

have insufficient resources to capitalise them on sufficient scale or to subsidise projects with green externalities.

4.4 Development of capital markets to better leverage private savings

Accessing and deepening local capital markets is needed to help NDBs grow in scale, given real or perceived fiscal constraints in many countries. This is an area that is often overlooked, but will be crucial if vast pools of private domestic savings are to be mobilised into LCCR infrastructure investment.

Although equity markets are important, the G20 said at its Cannes summit in 2011 that an action plan for the development of local-currency bond markets was crucial to a country's fiscal stability and economic growth (Silva et al., 2018). Estimates suggest emerging-market local-currency debt amounted to 84–88% of total emerging-market debt between 2011 and 2017, largely driven by China, Brazil and Russia's ability to issue in their own currencies. That said, some African countries have seen a significant rise in local-currency debt and average maturities have been increasing (Silva et al., 2018).

Some of the development of local-currency bond markets has been aided by RDBs and MDBs. The AfDB created the African Financial Markets Initiative to provide source funding for local borrowers, while the ADB is working to establish a facility that will provide technical assistance and grants to potential issuers of 'green' local-currency bonds (Silva et al., 2018). The World Bank, for its part, has raised funds in 32 emerging-market and frontier currencies. Meanwhile, in 2017, the IFC issued in 23 currencies and the EBRD issued in 11 (Silva et al., 2018).

Some NDBs have been able to slip into this role quite successfully. For example, the CDB has been instrumental in building China's bond market (see Box 11) and the DBSA successfully funds itself via its Domestic Medium Term Note Programme. Not all NDBs have this capability, however, because of the shallowness of their bond markets. An NDB – or any one entity – cannot simply create a local-currency

bond market by issuing bonds; it needs to be a concerted effort. Regulatory and other government authorities need to be involved and there needs to be an adequate supply of long-term savings, through institutional investors.

KfW recognised the need to develop local-currency bond markets when it established the African Local Currency Bond Fund (ALCB Fund) in 2012. It aimed to improve access to long-term funding in local currencies, strengthen the capacity of local markets and create opportunities for local investors. Since inception, the Fund has acted as an anchor investor and

Box 11 China Development Bank and China's bond market

Upon its founding in 1994, CDB adopted a hybrid model of fundraising, whereby it issued bonds in China's capital markets and used a 'zero-risk weighting' granted by the China Banking Regulatory Commission to entice bond purchasers. These purchasers tended to be state-owned commercial banks. Thus, while it looked as if CDB was funding itself on the traditional bonds markets, it was more akin to a commercial flow between state actors, predicated on CDB accessing domestic savings via the state-owned commercial banks. From 1994 to 1998, CDB and the People's Bank of China apportioned the bonds among purchasers (Chen, 2019).

In 1999, an auction-based bond-issuance process was formalised, allowing CDB's bonds to be resold, which increased bond sales and grew the nascent bond market. CDB's importance to bond-market development can be seen even today, as CDB bonds remain a benchmark for Chinese financial agencies and corporations issuing bonds. In 2017, CDB ranked as the second-largest bond issuer in China. Despite less government intervention, it has been able to maintain a low cost of capital, resulting in typical loan rates of around 4% and a net operating margin of 1.27% (Global Infrastructure Hub and Cambridge Economic Policy Associates, 2019).

provided technical assistance for local-currency bond issuance by financial-service providers and companies, specifically companies focused on financial inclusion, agriculture, housing, education and the renewable energy sectors (ALCB Fund, 2018a).

Since first funding the initiative, KfW has welcomed IFC, the UK's Financial Sector Deepening Africa (FSD Africa), FMO, Calvert Impact Capital, the US Overseas Private Investment Corporation and AfDB as co-investors (ALCB Fund, 2018b). Indicating its effectiveness, the fund's 44 investments, worth \$114.9 million, have raised co-investment of \$972.2 million from 2,026 local investors. The Fund has been largely focused on supporting micro-, small and medium-sized enterprises and the agriculture sector. However, in 2018, it invested in South Africa's first corporate green bond to fund Growthpoint's green-building office developments (ALCB Fund, 2019).

While the ALCB Fund provides a glimpse of the potential of NDBs to grow domestic markets, there may still be constraints beyond NDBs' control. Laeven (2014) cites stable macroeconomic policies, strong legal and institutional environments, financial infrastructure and adequate market size as requirements for local capital-market development. Unfortunately for NDBs, they have less control over these factors than over their investment decisions. Still, they can seize domestic market development opportunities when they present themselves, as they will also enable the scale-up of NDB operations.

NDBs' ability to catalyse private finance will vary by country. NDBs in more advanced economies with deeper capital markets have an easier time raising funds than, say, middle-income countries, which do not always have capital and banking markets with sufficient depth. Advanced-economy NDBs tend to benefit from high creditworthiness or government-backed guarantees. Poorer countries, with very shallow capital and banking markets, do not have this luxury, as their sovereigns usually have fairly low credit ratings. Of course, this is an evolving story. With the help of their NDBs, as well as MDBs, RDBs and DFIs, countries should develop domestic or regional capital markets, though

they may need to be more regional in the case of smaller economies. NDBs can play a key role here, as the case of China illustrates (Box 11).

4.5 International support

In terms of international policy dialogue and thinking, the pendulum is slowly swinging away from the ‘Washington consensus’ of ‘pro-market activism’ towards NDBs, with the latter recognised as important potential catalysers of investment in infrastructure (Griffith-Jones et al., 2018b; Mazzucato and Penna, 2018). Some MDBs and DFIs have embraced this agenda and are working closely with NDBs, while others have yet to take the leap. There are many examples of close collaboration and support, especially in Latin America, for example: NAFIN, IADB and IFC; the development of the wind market in Mexico; and CORFO, KfW and the development of the Abengoa concentrated solar power project (KfW, 2014). In Africa, UDB relies heavily on external finance and support and works closely with AFD, AfDB, Kuwait Bank, the Islamic Bank, the UN Capital Development Fund and the EU.

From our research and interviews, we identify several areas where this international support can play a critical role.

4.5.1 Improvements in governance

We came across several examples where NDBs’ collaboration with MDBs and DFIs, coupled with access to climate finance (from the GCF, for instance), enabled them to promote and enact governance reform. For example, several NDBs acknowledged that despite the onerous and bureaucratic GCF accreditation process, the application process to access and manage climate funds directly had generally improved internal systems, transparency and reporting. A number also noted that the engagement and support of the international community had helped protect them from national political interference, though it may limited national policy space (author interviews, 2019).

4.5.2 Access to international climate finance

For many NDBs, access to international climate finance is critical. Being able to get this

form of concessional finance greatly enhances their ability to build project pipelines, lend and invest at below-market rates, subsidise private investment to build markets and crowd additional private investment into LCCR infrastructure. This is especially important for NDBs that do not receive fiscal support from their governments and rely on the market for their financing (DBSA and NAFIN, for example) and for many small NDBs that rely on fiscal support, but are not well capitalised and cannot access international and local capital markets (such as UDB). These were cited by interviewees as key reasons for NDBs exploring and seeking GCF accreditation, as NAFIN, DBSA and UDB did (author interviews, 2019).

Furthermore, a number of countries – especially SIDS, which are extremely vulnerable to the effects of climate change – have a clear need to invest in adaptation to build resilience, but also have restricted and decreasing access to concessional development finance. Consequently, access to highly concessional international climate finance will be critical for their governments and NDBs.

4.5.3 Capacity-building

In our interviews, respondents indicated that MDBs and DFIs had also played an important role in building the capacity of NDBs and had supported their ambitions to become accredited to access international climate finance. In some cases, these entities had provided technical assistance to NDBs to build internal capacity, particularly in the area of human resources. The area where there continues to be mutual interest between technical assistance providers and NDBs is in identifying bankable projects and preparing them for investment. The funding of the development of capacity within NDBs underpins an aim from MDBs and DFIs to help the NDBs build a pipeline of projects where the MDBs, DFIs or other public and private investors can resource efficiently. In the long term, it will be advantageous for NDBs to pair their improving internal capacity with the financial capacity to take these projects from the pipeline to completion.

5 Policy recommendations

As discussed in chapter 4, having ‘good’ development banks implies having institutions that are well governed and well run, have clear mandates and are well resourced to operate at sufficient scale, so they can fulfil their mandates. These prerequisites point not only to action by policy makers, NDBs and regulators at the national level, but also at the international level. The international community needs to engage, support and build the capacity of NDBs and this includes channelling international climate finance through them. Accordingly, we make the following high-level policy recommendations.

5.1 Clear ‘green’ mandate

Where appropriate (if an existing NDB is well established and well run), a government should seek to ‘green’ the existing NDB and give the NDB a clear ‘green’ mandate. This mandate should be stable over time, with built-in flexibility to enable the NDB to respond to changing priorities and stages in the economic development process. This could include not just funding and the encouragement of investment in low-carbon activities, but also restricting – or even eliminating – funding investment in high-carbon activities, such as fossil-fuel electricity generation.

5.2 Policy integration

5.2.1 Seize on domestic opportunities

As outlined in prior sections, NDBs are among the best-placed entities to incentivise private investment and mobilise their own funding in any sector a government would like to grow. However, to accomplish this, NDBs need to be integrated into government strategy. The level

of integration is a delicate balance, but NDBs such as UDB and NAFIN indicate the efficacy of a strong, arm’s length relationship with government. NDBs offer their governments a tool to attract much-needed private investment, draw on professional skills for negotiation with private investors and steer investment to priority sectors. It is clear that well-governed NDBs should be at or close to the centre of economic development planning in all countries, especially if that planning requires catalysing investment to sectors that may not yet be commercially viable, as is the case for some LCCR infrastructure.

While NDBs should, in theory, be at the policy table and integrated into development plans, they also have a responsibility to the government and must deliver on their potential. Good governance and operating on commercial principles create a virtuous circle, where policy-makers rely more on NDBs to deliver on certain priorities and successful NDBs are rewarded with more priority government tasks, hopefully with the corresponding resources. A recurring theme in our interviews was that NDBs need to be proactive. They can facilitate solutions to many problems their policy-makers are facing, but policy-makers need to be aware of what they can achieve. NDBs must be their own advocates if they are going to lead in the transition to an LCCR future.

5.2.2 Increase integration among international actors

As mentioned, the majority of international climate funds flow through RDBs and MDBs. Though not the optimal outcome for NDBs, this does highlight the need for greater integration among NDBs and these other institutions. Based on our interviews,

there does seem to be a thawing of relations, after they were strained following calls for the privatisation of the NDBs in the 1980s and early 1990s (Williamson, 1990). A prominent example is IADB's work with NAFIN to fund wind projects with resources from the CTF. This cooperation saved a number of wind projects that had lost commercial financing following Mexico's financial crisis in 2008 and 2009. Relationships have continued to strengthen since then and NAFIN considers both RDBs and MDBs to be important partners in building the project pipeline and facilitating NAFIN's capacity (author interviews, 2019).

Another promising example of collaboration is the VERT-Infra initiative, outlined in Box 12, which works across the three stages of infrastructure investment and draws on the comparative advantages of NDBs, MDBs, RDBs and DFIs.

These examples are illustrative of the way NDBs, RDBs and MDBs can collaborate on specific goals. The transition to an LCCR economy with green infrastructure will require significant resources; many NDBs simply do not have these because their investments are already tied up in other economic sectors. The ability of RDBs and MDBs to access funding on capital markets is rivalled only by the most financially strong sovereigns. This presents a mutually

beneficial opportunity. Smaller NDBs can play to their non-financial strengths – local knowledge and networks to source and develop investible or close-to-investible projects to which RDBs and MDBs can target their financial wherewithal. RDBs and MDBs could act as co-financiers or partners for larger, more established NDBs, to generate sufficient concessional financing to incentivise private investors. Either way, greater integration among NDBs and their international counterparts has little downside, as long as each entity is valued for the advantages it brings to a transaction.

5.2.3 Increase integration with international climate funds

As discussed, even though international climate funds are but a small part of the total climate-finance architecture, they have played a valuable role in helping some NDBs to develop their green investment portfolios, especially in terms of building investible pipelines and bolstering the capacity of some NDBs to undertake LCCR investment. Regardless, and although these funds are targeted at developing countries, the involvement of NDBs has been quite limited.

As can be seen in Table 2, there are no NDBs directly accessing the CIF. The DBSA is the only NDB partner agency of the GEF, although NDBs can access GEF funds

Box 12 The VERT-Infra Initiative

Developed for the One Planet Lab by IFC, CPI, HSBC, the Institute for Climate Economics, the GCF, OECD and the French government, the Vision for an Environmentally Responsible Transition – Infrastructure (VERT-Infra) aims to systemically scale up global climate finance, with a focus on three key but under-developed sustainable infrastructure sectors: energy storage, transport and buildings (OECD, 2019a).

The intention is that VERT-Infra will work across three phases of a project. In the preparation phase, project preparation funds, financed by MDBs and philanthropic organisations, will provide resources for technical assistance to make green projects bankable. In the construction phase, sustainable financing conduits (SFCs) will lend to NDBs and other local financial institutions. SFCs will be funded by MDBs and DFIs, while raising additional debt on capital markets. In the operational phase, sustainable infrastructure funds will provide an opportunity for NDBs to offload their participation to asset managers looking for sustainable infrastructure assets, thereby allowing NDBs to free up capital and capacity for new projects (Déséglise and Freijido, 2019). There is no official launch date for VERT-Infra, but its focus on integrating NDBs into multinational funding structure looks promising.

indirectly through RDBs, such as the IADB, AfDB or ADB. The GCF is notably different in this regard. Its mandate promotes country ownership and national authorities can directly access its funds. As Table 2 shows, 11 NDBs have been accredited for direct access, but as Figure 9 illustrates, most GCF commitments are channelled through multilateral accredited entities, either RDBs, MDBs or UN agencies, and the actual disbursement of funds to date through these multilateral channels has been very low (GCF, 2019c).

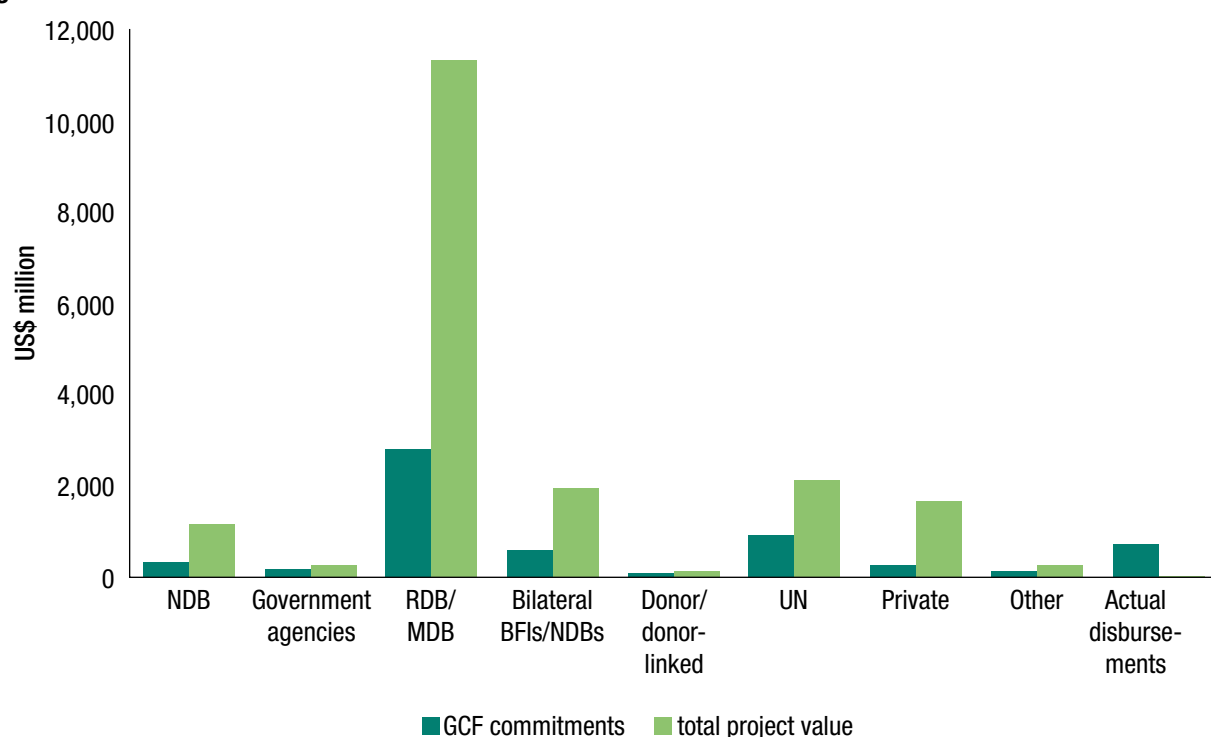
For the GCF, NDAs' lack of capacity and the potential involvement by NDBs were issues raised on numerous occasions over the course of our research. The consensus was that many NDBs did not have the capacity to meet the accreditation requirements and that the monetary incentive to undergo the onerous process involved was not enough of an incentive, given the size of the GCF relative to the loan books of the NDBs. Take, for example, the Development Bank of the Philippines, a relatively small development bank that still has over \$13 billion in total assets. What is the point in meeting the rigours of GCF accreditation to get access to a fund that has only disbursed \$700 million

since its inception – 60% of that through two organisations (GCF, 2019c)? Some NDBs can transition their portfolios to support the LCCR economy without the international climate funds; they just need to be proactive in doing so.

The GCF (2019a) reports that \$155.7 million has been committed through its Readiness and Preparatory Support Programmes, aimed towards helping 'strengthen the institutional capacities of NDAs or focal points and Direct Access Entities to efficiently engage with the Fund. Resources may be provided in the form of grants or technical assistance' (GCF, n.d.b). While this is a large sum, it is split between 127 different countries. It also doesn't directly address some of the qualitative hurdles to accreditation mentioned by our interviewees, including the need for all documentation to be submitted in English and the sheer number of documents involved. One accredited entity told us that they sent over 10,000 pages of documents to the GCF during the accreditation process (author interview, 2019).

Leaving aside the capacity issue, evidence suggests that engaging with the GCF is difficult for all entities. According to documents released at its latest board meeting, the GCF had 93

Figure 9 Total Green Climate Fund commitments to date



Source: GCF (2019c)

actively approved projects; of these, only 32 were disbursing funds and only one involved an NDB. Of the 32 projects disbursing funds, 15 involved the United Nations Development Programme (UNDP) (GCF, 2019c).

As the GCF is likely to become the largest global climate fund in light of recent replenishment announcements, the GCF needs to recognise the current flaws in its accreditation process (see Box 13) and the important roles that NDBs can play in helping unlock private and public finance. While its statement of partnership with the IDFC is a good first step (GCF, 2019b), further outreach and work with other convening NDB organisations, such as AADFI, ADFIAP and ALIDE, would actually enable greater feedback from NDBs and allow the GCF to tackle broader structural issues in its processes.

5.3 The shift from mere financier to dual financier and mobiliser

If private finance is to be mobilised at scale, NDBs will have to increasingly shift their focus from merely (or mostly) providing long-term public investment in infrastructure to mobilising private investment in LCCR infrastructure. This will require NDBs to adopt a more strategic and dynamic approach to market development,

shifting from direct, ad hoc investments to strategic pipeline development focused on market creation, gradually exiting investments and markets that become commercial. Among other things, this shift will require a change in business model and the more effective use of NDB balance sheets, drawing on more catalytic techniques and instruments.

5.3.1 A cautious increase in the use of guarantees

Our interviewees cited guarantees as an under-utilised instrument. This chimes with their limited use more broadly throughout development banking. On the face of it, the limited use of guarantees is surprising, given their leveraging potential, but there are reasons for it. In a recent review of the topic, the Milken Institute and the OECD outlined strategic, operational and financial constraints affecting the use of guarantees (Lee et al., 2018). First, from a strategic perspective, guarantees are evaluated differently by development organisations and the private investors they hope to crowd into a project. They are viewed by development organisations as a way to share risk with private investors, but these risks may be in markets where private investors want no risk. Moreover, private investors may look to

Box 13 Green Climate Fund accreditation levels

Though the accreditation process for the GCF may be onerous, it also has positive reputational effects for NDBs. The GCF offers tiered accreditation through its ‘fit-for-purpose accreditation approach’ (GCF, n.d.a), where entities are accredited in one of four categories based on the proposed scale of their intended activities.

- Micro: maximum GCF contribution of \$10 million.
- Small: maximum GCF contribution of between \$10 million and \$50 million.
- Medium: maximum GCF contribution of between \$10 million and \$250 million.
- Large: GCF contribution of more than \$250 million.

Of the 88 accredited entities, 16 are accredited for micro-sized projects, 25 for small-sized projects, 19 for medium-sized projects and 28 for large-sized projects.

The GCF indicates that all potential accredited entities are assessed against basic fiduciary standards, the presence of environmental and social safeguards drawn from the IFC’s Performance Standards, and whether gender considerations are translated into entity operations (GCF, n.d.a). The GCF does not disclose on its website whether the assessment against these standards are scaled according to the level of accreditation sought by an entity and, if so, by how much.

refinance or sell their exposure prior to maturity, so there needs to be a liquid market for the guarantee. This is not something that concerns development organisations, as their objective is the development impact, not the financial return. Thus, the two parties are not aligned.

It may also be that there is little motivation for guarantees within NDBs. Loans are more profitable than guarantees due to their higher spreads, while guarantees are more complex (sometimes too complex, so risks are opaque) and require greater capacity than loans and/or grants. For the NDB, guarantees mean less compensation for more work. Moreover, depending on accounting rules, the guarantee may be carried on the balance sheet as if it were a loan (Venugopal et al., 2012).

How guarantees are included on the balance sheet of the private investor can further undermine their utility. Under Basel III, loan amounts guaranteed by private investors are subject to a risk-weighting formula that acts as an input to private investors' risk ratios. To some, this is the promise of guarantees: that an MDB with a AAA credit rating will fully or partially guarantee the investment at the zero risk weighting prescribed by Basel III (Lee et al., 2018). However, most NDBs (and their sovereigns) do not have an AAA rating and the amount de-risked under Basel III is less than the amount of the guarantee, rendering that inherent promise moot.

The allure of guarantees lies in the possibility that, if the constraints can be relaxed, they could

be used in lieu of loans on certain projects, leaving NDBs' capital untouched. NDBs should therefore explore using guarantees, but be mindful of the risks.

5.3.2 Securitisation where possible

As discussed in chapter 3, the technique of securitising assets enables the recycling of NDB capital, can support local capital-market development and can give NDBs access to local institutional investment. It will generally have greater potential in countries where local capital markets are developed, so will probably be of more limited use in low-income and lower-middle-income countries where local capital markets are underdeveloped and NDBs may not be well capitalised.

That said, where capital-market development and NDB balance sheets allow, NDBs could explore how securitisation and other techniques, such as those employed by the BNDES Sustainable Energy Fund, could be adapted, replicated and scaled (while being mindful of the risks). It is important to research such instruments carefully, as they can potentially be rather complex, risks may be opaque and risk management may be costly. Above all, securitisations need to be properly structured and the risks priced correctly, so as not to generate excessive contingent liabilities. The problems caused by securitisation during the financial crisis of 2007–2009 suggest caution is warranted.

6 Policy conclusions and suggestions for further research

There is growing recognition that NDBs have huge untapped potential to further support the achievement of the SDGs, especially the critical transition to a sustainable LCCR economy. NDBs are an important part of the financing architecture, but are often overlooked and do not feature in the international and domestic policy debate. There is a disproportionate focus on the core MDBs in the development- and climate-finance discourse and this is a huge oversight, as the firepower of the NDBs far exceeds that of the multilateral system. This lack of focus on NDBs means there is a huge gap in understanding and emphasis, which ultimately undermines the effectiveness of policy and financing at the international, regional and national level.

NDBs are complementary to the multilateral system and have a number of distinct comparative advantages. They can have extensive knowledge of opportunities for and barriers to investment in their countries, long-standing relationships with the local private and public sectors and a development mandate. They can also work closely with national authorities to support economic development plans. NDBs can help support the creation of a pipeline of bankable projects and the development of domestic financial sectors to channel institutional investment to LCCR investment.

The crucial role of NDBs is increasingly accepted, but far more needs to be done to see them fully recognised as key actors in the development- and climate-finance architecture at the international, regional and national level. They need to be enabled to realise their potential,

by improving their own performance through better governance and new business models and by helping to shape national policy so they can operate more efficiently and support the transition to an LCCR economy – for example, through broader macroeconomic and regulatory frameworks and deeper domestic capital markets. It is also clear that most international climate finance is captured by the multilateral system, bypassing these national institutions, which are uniquely placed to leverage it to maximum effect. This needs to change.

6.1 Policy conclusions

We identify a number of key policy recommendations that need to be actioned at the national and international level to unleash the true potential of NDBs.

At the national level, governments need to:

- give NDBs a clear and stable ‘green’ mandate that includes supporting national development strategies and helping to meet the SDGs more broadly. This could include not just funding and encouraging investment in low-carbon activities, but also restricting – or even eliminating – the funding of investment in high-carbon activities, such as fossil-fuel electricity generation;
- integrate NDBs into their policy framework and design and ensure that supportive policy and regulatory frameworks are in place. This will facilitate NDBs’ direct lending and investment in long-term activities to support

- green transformation and help catalyse private flows to those activities;
- ensure NDBs are well resourced and have sufficient capital. NDBs should therefore be able to help facilitate greater leverage of private resources, especially in countries with deep private capital markets. Where these do not exist, governments and NDBs should help to develop and deepen them;
- help to develop not just the financial, but also the valuable non-financial roles of NDBs.

NDBs need to:

- strengthen their governance and management;
- shift their business model from that of mere financier to a dual role of financier and mobiliser, adopting a more strategic and dynamic approach to market development and the mobilisation of private investment for LCCR;
- adapt and choose a mix of instruments to maximise impact on LCCR investment while limiting contingent liabilities;
- seek to understand and manage the transitional and physical risks of climate change to their investment portfolios.

At the international level, MDBs, DFIs, donors and the international community need to engage with these institutions:

- to support and build the capacity of NDBs, ease excessively burdensome access hurdles to climate finance funds and channel the majority of international climate finance directly through national institutions, particularly NDBs, rather than the multilateral system;
- to help international climate funds understand how NDBs operate, which will help facilitate their access to such finance.

6.2 Suggestions for further research

Over the course of the study, we identify several areas requiring further research.

6.2.1 The role of NDBs

NDBs' increased role as dynamic mobilisers of additional private resources raises the important issue of how to measure their performance and how to build an accountability framework for their new role. This framework must be carefully designed not only to measure the level of additional private flows they generate, but also their impact in terms of meeting the SDGs – more specifically, their effect on achieving greener, fairer and more dynamic development. This methodological challenge requires further research, especially as NDBs' influence may be more limited when it comes to the additional private flows they can catalyse indirectly. Indeed, one of the challenges may be to design mechanisms that help maximise, or at least increase, the policy steer that NDBs can exercise over private flows, so they are more SDG consistent.

Our interviewees noted that the non-financial services provided by NDBs, such as helping governments design appropriate renewable energy policies or supporting the preparation of scalable projects, are very valuable functions. Further research is required on this understudied non-financial role and how to capitalise on it.

Much emphasis is placed on mitigation rather than adaptation investment, which builds climate resilience. Further study of NDBs and adaptation investment is necessary, as the challenges, approaches and instruments are likely to vary by sector.

6.2.2 Instruments used

Several different instruments are available to NDBs, both traditional (such as direct loans) and newer ones (for example, guarantees and securitisation). A careful evaluation of the advantages and disadvantages of different instruments is required, including their positive impact (or otherwise) on greening the economy and other objectives of national development strategies.

Research on the effective allocation of grants to ensure clear SDG impacts is important. This type of work is crucial for grants allocated to private financial intermediaries and investors, to better understand the dynamics of any moral

hazard that may exist and to prevent grants from creating windfall gains for these private actors.

6.2.3 Conditions required for ‘good’ NDBs

There are many instances of NDBs having broadly good governance or improving their governance significantly. Further research on how best to ensure good governance and subsequent impact would help inform reform efforts. This research could include case studies of NDBs that have been recognised as ‘good’ development banks for all or most of their existence and those that have successfully transitioned from poor governance structures to stronger ones.

Scale is a clear issue, as NDBs need sufficient scope and size to have a significant impact on meeting the SDGs and supporting the transition to an LCCR economy. There may, however, be

limits to how fast they can grow. This suggests two potential areas for research. First, what are the criteria for determining the appropriate (optimal) size of an NDB’s total capital and how does this vary according to a country’s level of development, development challenges, capital development, private banking markets and other factors? Second, how is the speed of operational scale-up determined and what are the risks of scaling up too rapidly?

Operationally, there are interesting research questions, too, in whether it is better for NDBs to be centralised or to have regional branches/offices of significant size, and whether it is better for a country to have one very large NDB that benefits from portfolio diversification or several NDBs that specialise in certain sectors, such as agriculture, infrastructure or industry.

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Annex 1 Institutions interviewed

Association of African Development Finance Institutions

Association of Development Financing Institutions in Asia and the Pacific

Agence Française de Développement

Brookings Institution

Climate Funds Update

Corporación de Fomento de la Producción

Convergence

Development Bank of South Africa

Green Climate Fund

Inter-American Development Bank

International Financial Consulting

Nacional Financiera

Organisation for Economic Co-operation and Development

Overseas Development Institute

Uganda Development Bank

Annex 2 Author of classification of GCF-accredited entities

Type of author	Author
Nationally focused operations	
NDB	<ul style="list-style-type: none"> • Development Bank of Southern Africa
Government agency/public	<ul style="list-style-type: none"> • National Bank for Agriculture and Rural Development (India) • Agency for Agricultural Development of Morocco • Centre de Suivi Ecologique • Department of Environment, Ministry of Health and Environment, Government of Antigua and Barbuda • Environmental Investment Fund (Namibia) • Ministry of Environment (formerly Ministry of Natural Resources of Rwanda) • Ministry of Finance and Economic Cooperation of the Federal Democratic Republic of Ethiopia • Peruvian Trust Fund for National Parks and Protected Areas
Internationally focused operations	
RDB/MDB	<ul style="list-style-type: none"> • Africa Finance Corporation • African Development Bank • Asian Development Bank • Banque Ouest Africaine de Développement (West African Development Bank) • Central American Bank for Economic Integration • Corporación Andina de Fomento • European Bank for Reconstruction and Development • European Investment Bank • Inter-American Development Bank • International Bank for Reconstruction and Development • International Development Association
Bilateral DFI/NDB	<ul style="list-style-type: none"> • Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden • Agence Française de Développement • Kreditanstalt für Wiederaufbau
Donor agency/donor-linked	<ul style="list-style-type: none"> • Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
UN	<ul style="list-style-type: none"> • Food and Agriculture Organization of the United Nations • International Fund for Agricultural Development • United Nations Development Programme • United Nations Environment Programme • World Food Programme
Private bank/fund	<ul style="list-style-type: none"> • Acumen Fund, Inc. • Deutsche Bank AG • MUFG Bank, Ltd • XacBank LLC
Other	<ul style="list-style-type: none"> • Caribbean Community Climate Change Center • Conservation International Foundation • International Union for Conservation of Nature • Secretariat of the Pacific Regional Environment Programme • World Wildlife Fund, Inc.

Note: The above item only includes entities that are involved in projects or programmes that have received GCF commitments.



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