



How can national development banks address key challenges associated with raising climate finance to increase investment flows for projects in their countries?

Case study: the role of NAFIN in enabling climate finance flows into Mexico

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Note

The NAFIN Visiting Fellow programme is hosted by the Latin America and Caribbean Centre (LACC), the Grantham Research Institute on Climate Change and the Environment (GRI) at the LSE. The programme supports one fellow each year to ‘address the challenges to international climate finance flows from the perspective of the national development bank’. The views expressed in this Working Paper do not reflect the position of the LSE, the LACC or the GRI.

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Abstract

This research report considers how national development banks (NDBs) can attract international and private finance to invest in climate projects within their own countries. Although total global climate finance flows are increasing and in 2014, they were put at \$391 billion, it is estimated that this figure would have to increase by 2.6 times to transform the global economy into a low-carbon society. NDBs play a critical role in accelerating flows due to their capacity to take greater risks at early stages through a variety of instruments and structures, and to provide technical assistance and training.

This paper presents a case study of Nacional Financiera (NAFIN, National Finance), Mexico's largest development bank in terms of loan portfolio, in order to discuss the barriers to increasing finance flows into low-carbon sectors and the role of NDBs in increasing the number of investable projects. It analyses the measures that NAFIN could take to accelerate these financial flows and presents different ways that NAFIN (and the NDBs of other countries) could help develop financial instruments and mechanisms to support climate change mitigation and adaptation.

1. Understanding the challenges of international climate finance

Achieving the Paris Agreement Nationally Determined Contributions (NDCs) will require mobilising finance resources at an exponential scale. A strategic approach to redirect flows of capital is required: this will not only allow the NDC targets to be met, but will also achieve a more profound shift to a sustainable economy where climate change is mainstreamed. This will result in an increased low-carbon and resilient ambition in 2018 when the facilitative dialogue among United Nations Framework Convention on Climate Change (UNFCCC) Parties will take stock of progress in meeting NDCs and show global leadership.

Climate finance has become a pressing issue for the global community, and a priority for developing countries, as agreed at the 15th UNFCCC in Copenhagen in 2009. The Copenhagen Accord agreed that Annex 1 countries (developed countries) would commit to a goal of mobilising a combined total of \$100 billion a year by 2020 ‘to address the needs of implementing mitigation and in meeting costs of adaptation’ for non-Annex 1 (developing) countries. Many of these non-Annex 1 countries are situated in the equatorial regions where changes in the climate are expected to be most severe, and these countries have not achieved the levels of development to make their infrastructure resilient to the negative impacts of climate change. These include countries that will be affected by natural disasters, as well as those susceptible to the possible economic impact of climate change (OECD, 2015). The convention highlights activities such as investing, insurance and technology transfer that are key to meeting the needs of vulnerable countries.

Consequently, helping developing countries transition to low-carbon economies represents a huge investment challenge. Public actors including governments, bilateral aid agencies, climate funds, and multilateral, bilateral and national development finance institutions (DFIs) drive the global climate finance system by reducing the costs and risks of climate investment. They do this primarily by issuing concessional loans, strengthening knowledge and technical capacity and building the track record needed to enhance confidence in such investments, as well as integrating climate finance commitments into their operations – ranging from 11% to more than 50% (27% on average) of new annual investments (Buchner et al., 2015). Public actors delivered more than half their financing in the form of grants and low-cost loans, which accounted for 10% (\$14 billion) and 47% (\$69 billion) of total public finance respectively (Buchner et al., 2015).

According to Climate Policy Initiative (CPI), grants made up for more than half of government entities’ and climate funds’ respective commitments in low and lower-middle income countries, representing 34% or \$5 billion of total grants. Low-cost loans (including concessional loans) provided by bilateral DFIs accounted for 64% (\$11 billion) and by national DFIs for 78% (\$52 billion).

Latin American countries now need to seize the finance opportunity and direct its efforts in a strategic way. This will involve addressing how to scale up and speed finance flowing into priority sectors, how to make better use of technical assistance funding and international cooperation, and how to increase the institutional capacity needed to identify

and develop a pipeline of transformational projects for financing that fulfil key policy priorities. Development banks have a crucial role to play in this transformation given their mandate for achieving development goals and for being a financial stakeholder that can operate to achieve government aims.

The Mexican government recognises it is at a critical point in its development and needs to attract new and redirect existing financial resources to make the transition into a low-carbon climate-resilient economy. Development banks play a critical role in accelerating flows due to their capacity to take greater risks at early stages, through a variety of instruments and structures, and provide technical assistance and training. This paper presents a case study of NAFIN, in order to discuss the barriers to increasing finance flows into low-carbon sectors and the role of NDBs in increasing the number of investable projects. It analyses the measures that NAFIN could take to accelerate these financial flows and presents different ways that NAFIN (and the NDBs of other countries) could help develop financial instruments and mechanisms to support climate change mitigation and adaptation.

The project could potentially strengthen NAFIN's reputation and position the institution as the leading development bank in Latin America scaling up climate finance. In the medium term, this could offer better transfer pricing for the development of the micro-medium-and-small-enterprise (MSME) sectors, clean technologies and large scale sustainable projects, thus improving NAFIN's profitability.

Given the extremely short period available to complete this report, the research provided must however be regarded as preliminary, to be improved and developed further.

2. Involving the financial sector in international climate finance

According to Richardson (2009), in the present era of ‘finance capitalism’ – an economic system dominated by the financial sector and involving the propagation of a complex system of banking services, securities markets, and other financial instruments – the finance sector is likely to play a central role in climate policy. It can help to price climate risks and facilitate investment in renewable energy and efficient technologies. The investment community increasingly considers some action on climate change as in its own interest, climate change brings risks to the value of their investment portfolios or their borrowers’ solvency through tightening climate regulations, potential destruction of physical assets, and reduced long-term income.

However, the financial market continues to invest in fossil fuels, which were estimated to have \$5trillion in stock market values in 2014 (Bullard, 2014). Though current low oil, gas and coal prices have made decreased the attractiveness of investing in fossil fuels, fossil fuel investments provide scale, returns and liquidity that many other kinds of investment assets (including low-carbon projects) do not have. Nevertheless, there are positive developments, with international institutions divesting from coal due to the increasing competitiveness of gas, along with tightening environmental regulations that make low-efficiency coal generation less viable. Although the Financial Stability Board (FSB) has released guidelines calling for the financial community to disclose the level of climate risk in their investment portfolios, there will still need to be significant institutional appreciation of climate change risk to shift investments away from fossil fuels and move into the necessary transition to a low-carbon economy.

More specifically, the financial sector can facilitate the allocation of capital for climate mitigation and adaptation by acting as an intermediary or a transactional mechanism to allocate investment capital to renewable energies, clean development mechanisms and carbon emission trading. In retail financial markets, mutual funds sell climate-friendly investment portfolios, and banks offer loans to improve energy efficiency for individual homes. The financial sector, however, could play a more ambitious role on climate issues. For most investors, global warming is (at most) mainly a matter of financial risk or investment opportunity (Richardson, 2009).

Progress in nations, cities and regions has been slow, but momentum is building. Climate change and sustainable infrastructure is now a priority for regional development banks, with the World Bank, the International Monetary Fund (IMF) and the FSB all aiming to enable low-carbon growth and stability.

International climate finance: current status

According to Climate Policy Initiative’s report *Global Landscape of Climate Finance 2015* (Buchner et al., 2015), the estimated amount of climate finance invested in 2014 was \$391 billion, an 18% increase from the previous year’s \$331 billion. The main reason for this

increase is that public actors are recognising the benefits of climate action for achieving their goals of climate change and it is now in their national economic interest. Public climate finance has grown at an average rate of 9% since 2012, and it was worth an estimated \$148 billion or 38% of total climate finance in 2014. Private investments make up 62% of the total amount invested in 2014, worth \$243 billion (see figure 1).¹

In order to encourage and enforce further progress of the financial mechanisms and instruments for climate action the Global Environment Facility (GEF), the Special Climate Change Fund (SCCF), the Least Developed Countries Fund (LDCF), and the Green Climate Fund (GCF) have been called upon (Global Environment Facility, 2016). These climate funds are just some of many that provide support for climate action not only through finance, but also in formulating policies, strategies, programmes and projects. Public investors make up 38% of total global investments in climate action and only 1% of this is spent by climate funds. Development finance institutions (DFI) supply 89%: these organisations include multilateral development banks such as the Asian Development Bank (ADB), the Development Bank of Latin America (CAF), the European Bank for Reconstruction and Development (EBRD) among others, and International Finance Institutions (IFI) such as the World Bank (WB) and the International Monetary Fund (IMF). The remaining 9% of the public investments come from governments and agencies such as the European Commission, or the development funds of organisations such the Commonwealth Development Corporation (CDC).

The other 61% of global investments in climate actions comes from project developers, corporate actors, commercial financial institutions, households, private equity, venture capital, infrastructure funds and institutional investors (Buchner et al., 2015). Key determinants of private actors' financing behaviour include policy and market signals, predictable and stable profits, and the strategic potential of investments. However, obtaining the requisite technical expertise, gaining access to finance, and managing project risks remain challenges for enabling shifts in the patterns of private climate finance investments (Buchner et al., 2015). Public financing, and particularly national development banks, can play an important role in addressing these challenges.

Figure 1 below shows that out of the total climate finance flows in 2014, balance sheet financing accounted for \$175 billion, or 72% of total private investment, and accounted for only \$3 billion of public investments. On the other hand, low-cost debt (loans and concessional loans) and project level market rate debt accounted for most public investments: a total of \$127 billion, or 86% of total public investment. Other instruments used to finance private and public investments are project level equity and grants.

¹ Out of the \$243 billion invested by private actors in 2014, a 36% increase, or \$22 billion came from growth in new renewable energy investment in China, which accounted for 34% of all private finance in 2014 and was mainly driven by supportive government policies, incentives, and ambitious targets (Buchner et al., 2015).

Figure 1. Climate finance flows, actors and instruments

Global total climate finance flows in 2014, in USD billion	391	100%
Private Investment	243	62%
Public Investment	148	38%

Breakdown of total finance by actor, 2012-2014, in USD billion	Public	% of Total	Private	% of Total	
National DFIs	66	45%	92	38%	Project Developers
Multilateral DFIs	47	32%	58	24%	Corporate Actors
Bilateral DFIs	17	11%	43	18%	Households
Government & Agencies	15	10%	46	19%	Commercial Financial Institutions
Climate Funds	2	1%	2.7	1%	Private Equity, Venture Capital, Infrastructure Funds
			0.9	0.4%	Institutional Investors

Breakdown of total climate finance by instrument, 2012-2014 in USD billion	Public	% of Total	Private	% of Total
Balance Sheet Financing	3	2%	175	72%
Low-Cost Debt	69	47%		
Project Level Market Rate Debt	58	39%	44	18%
Project Level Equity	2	1%	23	9%
Grants	14	9%		

Source: Climate Policy Initiative database for Buchner et al. (2014).

Note: missing details on actors and instruments may account for about USD 1-3 billion

Shortfalls in international climate finance

The 22nd session of the Conference of the Parties to the UNFCCC, known as ‘COP 22’ was held in Marrakech, Morocco in November 2016 and was intended to continue the momentum of the Paris conference, as by then 112 countries had ratified the Paris Agreement. Patricia Espinosa, the Executive Secretary of the UNFCCC, told at the opening of the conference that the rapid entry into force of the Paris Agreement ‘is a clear cause for celebration, but it is also a timely reminder of the high expectations that are now placed upon us all’. She stressed that finance is flowing, but it is not enough.

Moreover, Nationally Determined Contributions now need to be integrated into national policies and investment plans. She said support for adaptation needs to be given higher priority, and progress on the loss and damage mechanism must be ensured to safeguard development gains in the most vulnerable communities (United Nations Climate Change Conference, 2016)

According to the Stern Review commissioned by the British government, the cost of not taking immediate action to mitigate climate change is likely to amount to between 5% and 10% of world gross domestic product (GDP) each year, but taking action now could limit the cost to 1% to 2% of GDP (Stern, 2006). Globally, the additional investment required for transformation into a low-carbon society, compared with the cost of ‘just carrying on as we are’, probably lies in the region of \$200 to \$1,000 billion per year by 2030, and if the world does not take the necessary measures, could significantly exceed this amount between 2030 and 2050 (German Advisory Council On Global Change, 2011).

Considering that the global total climate finance flows in 2014 were estimated at \$391 billion, the additional average investment required per year to transform the global economy into a low-carbon society would be 2.6 times the current amount of climate financial flows.

Long-term growth will require large amounts of new investment, but precise figures are difficult to estimate given the uncertainty around economic factors, emerging technologies and climate impacts. However, literature shows that what the world is spending is far less from what it is required for the transition into a low-carbon economy (Stern, 2016).

There is capital available. At the Paris UNFCCC summit, targets and mandates to increase the allocation of capital into the green economy using \$43 trillion of assets under management (including by Multilateral Development Banks (MDBs), insurance companies, pension companies, and commercial banks) were set up with a view to help meet NDCs. (CAF, 2014).

Expansion of international climate finance flows

One way to increase funding for climate action is by increasing the monetary resources of International Financial Institutions (IFI) and Development Financial Institutions (DFI). An IFI and DFI can use their private funding to invest in projects or co-fund mitigation and adaptation initiatives with private finance. Furthermore, these organisations often have targets as to how much of their resources will go to climate action and these targets could be raised through encouragement from stakeholders (Bowen, 2011).

Another way to increase climate finance is through having more sources of funds. Climate finance flows mainly run north–south, between IFIs and DFIs in developed countries to projects and programs in developing countries. However, south–south climate finance (SSCF) can provide a supplementary resource stream for climate action. Developing countries have been providing SSCF in three major forms. First, developing countries have been contributing financially to multilateral climate funds such as the GEF. Second, countries have set up bilateral initiatives funding other developing countries. China has been the predominant country in this, spending \$40 billion between 2011 and 2015. China has also announced the creation of a south–south climate fund and is active in regional climate change co-operation. India and Brazil are also rising climate finance providers, through loans, grants and technical support. Third, new southern-led international organisations have been set up, most notably the New Development Bank (which is also referred to as the BRICS Bank) and the Asian Infrastructure Investment Bank (AIIB) (Ha, Hale, & Ogden, 2016).

Developing countries are investing in climate change mitigation and adaptation at home and across borders to achieve sustainable economic growth. Resources for climate challenges in developing countries can be expanded by increasing north–south climate finance. There has been a reluctance to emphasise SSCF because of fear that countries might think the urgency for financing by developed countries is reduced.

However, SSCF shows that climate finance is not just a charitable mechanism, but an instrument for economic growth, and it might increase pressure on developing countries to fulfil their financial promises. To seize this opportunity, countries should track SSCF in the UNFCCC reporting framework, recognise the full scope and various forms SSCF can take (including bilateral, multilateral, public, private, financial and in-kind instruments), and ensure that new multilateral development institutions coordinate with existing institutions to green all possible financial flows (Ha et al., 2016). The rise of climate finance among developing countries could help reach those goals.

3. Mexico: the need to scale up finance to meet national commitments

Mexico: policy context

Mexico was one of the first developing countries to submit an Intended Nationally Determined Contribution (INDC) ahead of the Paris Convention in 2015, pledging to make very significant reductions to greenhouse gas (GHG) emissions. The Mexico INDC included an unconditional pledge to reduce GHG emissions by 25% below the business-as-usual (BAU) baseline by 2030, which implies a 22% GHG reduction 51% of black carbon (BNEF, 2016b). Mexico proposed committing itself to deeper reductions, with emissions peaking in 2026, if a global agreement included the following: ‘international carbon pricing, carbon-sensitive levies, technical cooperation, access to low-cost financial resources and technology transfer on a scale equivalent to the global climate change challenge. Under these conditions, national reductions in black carbon could increase to 70% and in GHG to 36% by 2030, in a path consistent with the route proposed by the General Law on Climate Change (LGCC) that seeks a 50% reduction in the volume of emissions by 2050 in reference to a year 2000 baseline.’ (SEMARNAT, 2014).

Nevertheless, Mexico’s targets are not consistent with limiting warming to below 2°C, let alone with the Paris Agreement’s stronger 1.5°C limit and until now, the impact of Mexico’s target has been poorly understood and not quantified. (Climate Action Tracker, 2016). This represents a huge challenge for Mexico and it needs to take more action to meet these targets. Climate finance flows will play a critical role.

Meeting the pledges made in the Mexico INDC is regulated by national laws implemented before the INDC. These included the 2012 Climate Change Law (CCL), which requires GHG reductions of 30% by 2020 and 50% by 2050 compared to 2000 base year levels. The CCL also includes clean energy targets of 35% by 2024, 43% by 2030, and 50% by 2050. It should be noted that meeting the 35% clean energy target is also part of Mexico’s National Energy Strategy 2012-2026, and the Law on Renewable Energy Use and Financing for Energy Transitions. Under this law, clean energy refers to non-fossil fuel sources such as renewable sources (biomass, geothermal, small hydro, solar, wind), and also large hydro and nuclear plants.

The Mexican government recognised that a key factor in attracting private sector investments into clean energy projects is liberalising the vertically integrated electricity market. Starting in 2013 with completion planned for 2018, the Mexican power reforms include unbundling the state-owned utility, creating an independent system of grid operators, and introducing auctioning of wholesale, capacity, medium and long-term markets, transmission rights and clean energy certificates (BNEF, 2016b). In 2016, there were auctions for 394MW of wind and 1.7GW of PV projects, which are set to attract about \$2billion in investment between 2016 and 2018. The combination of electricity market reforms and decreases in technology costs for onshore wind and solar PV projects made Mexico in 2015 ‘among the top 10 destinations in the world for new clean energy investment, attracting a total of \$4bn’ (Climatescope 2016, 2016), and about \$12 billion between 2011 and 2015. Attracting this kind of financing will enable Mexico to increase the current level of renewable generation from 8% of the total power generation in 2015.

What is impressive is that the average price of the first power auctions in 2016 was \$48 per MWh, which constitutes some of the lowest auctioned prices in the world for renewable energy projects (BNEF, 2016a). Furthermore Mexico has net metering laws to encourage investments in distributed generation (that is, renewable generation from household and small-scale businesses), which led to 118MW being added in 2015 (BNEF, 2016b).² This represents the largest amount of distributed generation in Latin America. However, decreasing electricity tariffs mean that project economics for both large-scale and distributed clean energy generation are less favourable.

Therefore, Mexico instituted funding mechanisms to encourage investments in decarbonising the energy sector as early as 1982. The Mexico Sustainable Energy Fund received 20% of the revenues raised by a 0.65% annual tax (called the research and technology tax) that is imposed on the Mexican state-owned oil company Petróleos Mexicanos (Mexican Petroleum, PEMEX). In 2004, it introduced a tax break on renewable energy projects, and in 2008 introduced a \$223 million annual budget (under the Mexico Energy Transition and Sustainable Use of Energy Fund) that is targeted at financing renewable energy projects (BNEF, 2016a, 2016b).

However, these funding mechanisms are highly dependent on oil revenues. The country is facing a key challenge related to scarce public funding as a result of falling prices in the oil sector. Mexico now needs to scale up action towards implementation, and is at a crucial point of further engaging the private sector including the finance community to achieve its goals. Otherwise the scope for the federal government to promote growth will be limited in the future (Zamudio et al., 2016).

The need to scale up finance

It has been estimated that to meet its commitments, Mexico will have to mobilise around \$5 billion a year for clean energy projects from 2015 to 2029 (PwC Mexico, 2015). The overall estimated impact would be of 28.5GW installed capacity and the creation of 180,000 new jobs (PwC Mexico, 2015). The electricity sector alone is estimated to need an investment of MXP \$2,105,102 million from 2015-2029 (SENER, 2015). Looking more widely, the National Infrastructure Plan estimates a requirement of MXP \$7.7 billion,³ of

² Net metering: It applies to small and medium scale projects (up to 10 KW for residential use, and 30 KW for businesses and up to 500 KW for projects). It compensates the cost of used power with the one contributed to the national network. (Gibrán S. Alemán-Nava et al., 2014)

³ Investing in climate resilient infrastructure will be critical for Mexico. Located between two oceans, Mexico is highly vulnerable to the adverse impacts of climate change and it has suffered from extreme weather events such as tropical cyclones, floods, droughts and hurricanes, which have led to loss of life alongside high social and economic losses. The impacts of hydro-meteorological events alone caused average annual losses of \$1.33 billion from 2000 to 2012.

which MXP \$2.9 billion of private investment is needed by 2018 (Government of Mexico, 2007).

NAFIN, as a Mexican development bank, has a critical role to play in achieving Mexico's climate change commitments. Efforts have been made in financing low-carbon projects but a wider strategic approach to different instruments that could be used is needed to better identify the opportunities and accelerate the rate of low-carbon projects that NAFIN can finance.

NAFIN also is mandated to support financing of the micro-medium-and-small-enterprise (MSME) sector. The MSME segment plays a key role in the Mexican economy, representing 99% of all incorporated firms, 72% of the total Mexican workforce and 52% of Mexico's GDP. Although the MSME sector covers all major industries, there has been a recent growth in the oil and gas, mining and power, and chemicals and pharma industries such that they are becoming key sectors targeted by NAFIN.

Thus, NAFIN has been a crucial institution in financing Mexico's low-carbon transition. In 2009, NAFIN's Sustainable Projects Unit was created to participate in the financing of environmentally friendly projects and to focus on the strategic development of renewable energy infrastructure and generation. In 2010, NAFIN became the first Mexican bank to provide financing to a wind farm project with its own resources and credit lines from the Inter-American Development Bank obtained by the Deputy General Financial Division (DGAF). The DGAF's primary functions include the management of funding processes and investments, as well as national and international resources, to ensure sufficient funds for the financing of MSMEs and sustainable projects under competitive opportunity conditions, time and costs.

After 18 years of absence in the international markets, NAFIN issued the first two Mexican Green Bonds in 2015 and 2016, seeking to provide viability and profitability to wind and water projects, increasing the its portfolio of financed sustainable projects. This effort has been complemented with international cooperation with the Green Investment Bank and the Green Climate Fund, aimed at strengthening NAFIN's climate strategy by providing enhanced access to financial resources, as well as to support mitigation and adaptation actions in the country.

Thus, considering that Mexico needs to mobilise around \$5 billion a year in clean energy projects from 2015 to 2029, we estimate that NDFIs in Mexico should mobilise around 855 million per year⁴ towards its commitments. Since 2010, NAFIN has invested around \$3.3 billion, thus contributing to around 2GW of total installed capacity in Mexico, by adopting innovative financial strategies to provide viability and profitability to each project, using different financial mechanisms and instruments under competitive opportunity conditions and costs.

4 Calculated by considering that 38% of total investments are public investments and 45% of those are NDFIs. (USD \$5 billion x 0.38 x 0.45)

4. National development banks: meeting the challenges to enable climate finance

Key challenges for NDBs

The financial challenges involved in the transformation to low-carbon sustainable and resilient economies are significant, but controllable. However, literature and interviews identify challenges resulting in economic inefficiency and underinvestment of which national development banks (NDBs) will have to address to increase flows of climate finance. These factors are interrelated, requiring NDBs and associated institutions to have a comprehensive approach to enabling and scaling climate finance.

The first of the major challenges is **addressing market failures involved with information asymmetry, mispricing, regulation with unintended disincentives or consequences, and perception of excessive risk and lack of liquidity**. There is a lack of clarity on the disclosure of environmental information and performance of the projects, thus reducing the attractiveness of projects by creating information asymmetry between investors and recipients. This leads to mispricing of assets, due to the higher risk involved. There are no established regulations, guidelines nor green definitions, few incentives, and few severe consequences for not acting towards environmental, social and governance (ESG). This lack of information and policy uncertainty results in excessive risk aversion on the part of investors towards green projects.

These market failures involved with information asymmetry contribute to, and are translated into **potential risks factors involved with financial and economic, political and policy uncertainties**. Financial markets are constantly changing, thus economic conditions differ, presenting challenges for attracting new sources of capital and potential investors. When a higher risk is perceived, the cost of funding will be more expensive and investors will demand a higher return on their investment. Policy and regulations are influenced by current regimes, influencing the viability or attractiveness of an investment by creating uncertainty in the political climate and affecting the revenue of the projects. Thus, in-house financial expertise is needed to measure or control potential risks, such as a downgrade in credit rating, a change in inflation or an unanticipated change in policy.

These broader political and macro risks are compounded by the nature of the low-carbon projects that NDBs, such as NAFIN, face. Quite often, projects are small, relative to other investment opportunities, and generally more complex than conventional generation, resulting a **scarcity of investible projects**. There is no large pipeline of green projects to choose from that could allow institutions to create a well-balanced (low-risk and high-return) portfolio of operating assets to finance and to earn income from. Even when a bundle of projects is assembled, there is complexity in the number of processes involved in evaluating internal expected returns, the sources of capital (funding), as well as performing due diligence assessment of risk factors.

The lack of investible projects is also related to the **lack of technical expertise or institutional capacity with low-carbon technologies**, especially due to unfamiliarity with the technical and operational profiles of the technologies. There is a need to develop in-

house technical expertise and capacity to deliver viable interventions with stakeholders or project developers. There needs to be a capacity for detailed technical reviews and performance assessments carried out by well-established technical advisors to build portfolios of investable projects, which need to utilise proven technologies for power generation and the best alternatives in terms of financing.

The national development banks are the only institutions that can issue external debt or receive external loans, and need the approval of the Treasury for this (Secretariat of Finance and Public Credit, SHCP). National institutions do not have the capacity to design projects that ensure additionality of subsidies – most projects are financed with other financial resources and as all institutional expenditure has to be incorporated into the annual budget. No international resources are given if the institution has not spent its budget and at the same time, donations that give budgetary additionality that cannot be used.

The last challenge that NAFIN faces in being able to increase funding is its **inability as a NDB to go beyond mandated debt limits**. Following the debt crisis in Mexico, foreign loans cannot be made directly to public institutions. Instead, foreign credit finances the country's global debt. Mexico is the most efficient country in processing loans from the Inter-American Development Bank (IDB), but it is the worst country for making grants. The problem lies with the implementers, such as the national institutions, which have little capacity and experience in implementation. The problem of managing the budget exists at all levels and possible grants are not made because the SHCP is so strict in its assignment.

Key recommendations for NDBs to meet challenges

As the discussion above has shown, in order to meet their challenges NDBs need to have access to appropriate technical expertise, have access to finance as needed, and be able to manage project risks (Buchner et al., 2015). As these challenges are interrelated, it is important to build technical capacity to increase the amount of investible projects, which includes greater capabilities in managing risks, reducing market failures, and enabling technical expertise (including having more innovative financial instruments).

The key goal for a NDB is to be 'climate ready', through being able to plan for, access and deliver climate finance. Building a reputation for being climate ready means that NDBs need to accurately monitor and report on expenditures and returns. It also means being able to source local projects, which includes undertaking local risk assessment and building risk mitigation capability. However, a lack of existing projects means that NDBs need to nimbly target market niches that other actors are unwilling to invest in, to stimulate market development.

Furthermore, NDBs can play an intermediary role between international and local banks, by gaining knowledge about the local market, technology, policy and political conditions involved with low-carbon projects – both in terms of the current situation and future potential. This intermediary role requires them to develop relationships with local developers, politicians and finance institutions. The NDB thus becomes a financial hub

through the ability to ‘crowd-in’ local and international capital by reducing perceived and actual project-related risks.

Establishing guidelines to assess and manage risk

To achieve NDC targets and international climate commitments, NDBs will need to establish guidelines. Among these, the NDBs should strengthen its risk management, reduce market failures, build up technical expertise and apply innovative financial instruments.

NAFIN has implemented a series of guidelines and procedures to assess and manage risk in the financing of low carbon projects. To determine the financing feasibility of each project, the following elements are considered:

- Return on equity (ROE): the economic profit generated from the equity invested on the project. The ROE considers the funding cost, tenor, rate, amortization schedule, fees, capital factor and expenditure factor, among others.
- ‘Know your client’ (KYC) process to verify the identity of stakeholders in the project, as well as to prove the lawfulness of capital sources.
- General terms & conditions (GT&C): these are negotiated between the borrower and the lender(s) and should be accepted by both parties; they include obligations, term, interest rate and periodicity of payments and fees, among other requirements.
- Documentation review: every document of the project (permits, licences, commercial agreements, etc.) is carefully reviewed, as well as the interface between them.
- Financial model: the cash flows during the lifetime of the project are projected and stressed to prove the repayment capability of the financing. The forecast considers macroeconomic, technical, commercial, financial, fiscal and legal aspects.
- Quantitative & qualitative analysis of key participants (KP): all KP (shareholders, developers, off takers, technology providers and contractors, among others) are examined to determine their suitability for the project. The analysis includes an assessment of financial statements, key performance indicators (liquidity, leverage, income, ROE, ROA, earnings before interest, tax, depreciation and amortization, cash flows, etc.), relevant events, and activity reports, as well as a general overview of the company (purpose, employees, products, location, assets, etc.).
- Due diligence process: reputable external specialized firms are hired to examine the project documentation thoroughly and issue a report with suggestions and opinions of the suitability of the project, including the following:

- Legal advisors: review terms and conditions of the project documentation; validate government authorization and permits, public deeds, real estate rights and corporate documentation.
- Technical advisors: perform technical assessments, field visits and a review of technical aspects of the project.
- Financial advisors: verify the financial aspects of the project.
- Insurance advisors: corroborate that the project is appropriately insured.
- Environmental & social advisor: assess the environmental and social impact on the site of the project and the local communities.

Case study: NAFIN's role in developing wind projects in Mexico

In 2010, wind energy was relatively new in Mexico. There was no precedent of a financial institution involved in the construction of a wind farm in the country. Neither the NDBs nor the national commercial banks had the technical expertise to take on such specialized projects. There was also a market failure due to the lack of financial institutions willing to take the risk of financing wind farms.

In May 2010, recognising the need to move from fossil fuels to clean sources of electricity, NAFIN, alongside several multilateral and international financial institutions, developed a financial scheme to finance the first wind farm in Mexico. Supported by the Mexican government (with its aim of developing the wind sector in Mexico), NAFIN granted the first financing for the construction and development of the largest wind farm in Latin America: 'Eurus'. This is located in Juchitán de Zaragoza, in the State of Oaxaca and cost \$550 million to build. Its 167 wind turbines generate 250.5MW, sufficient power to supply about half a million people and it is estimated to reduce annual carbon dioxide emissions by 600,000 metric tons.

Following this lead, NAFIN's Sustainable Projects Unit, has financed 13 wind farms, one solar power installation and two hydroelectric plants across nine states in Mexico. These projects represent an investment of more than 4,000 MDD and 1.7GW of installed capacity, increasing NAFIN's portfolio by 700% from 2010 to the time of writing.

5. Conclusion

Development banks should play a critical role in promoting economic growth through implementing federal government policies. The main focus should be on areas where people and businesses face difficulty in accessing climate finance, as well as in the structuring of schemes to encourage greater involvement of private financial markets.

As mentioned, developing countries now need to seize the finance opportunity and direct its efforts in a strategic way that addresses how to scale up and speed finance flowing into priority sectors. They need to make better use of technical assistance funding and international cooperation increase the institutional capacity needed to identify and develop a pipeline of transformational projects for financing that fulfil key policy priorities. Out of the global total investments in climate actions, 61% comes from project developers, corporate actors, commercial financial institutions, households, private equity, venture capital, infrastructure funds and institutional investors. Thus, there is a need to mobilize these actors to accelerate finance flows. This is where development banks like NAFIN play a key role by reducing risks and leveraging finance.

At the global level, most climate finance is provided by the private sector. However, in other countries with high GDPs, green banks have been established as guidelines to support MSME projects and such an initiative could be explored in Mexico to support non-profit institutions dedicated to promoting clean technologies, where they provide training and access to technology, eliminating some of the factors that hinder the acceleration of green financing. These companies could then grow and have direct access to different climate finance resources, mechanisms and financial instruments. As public resources are limited, they could be used as collateral for loans to large projects that are not initially financially profitable, but which might move into profit as clean energy is produced.

It is important to take action to facilitate investments in clean energy because the impact of not doing so will be greater on the environment, which will translate into high economic impacts for everyone. Short-term economic results should not limit action since it is cheaper to act earlier than later and move Mexico to a low-carbon economy, not primarily dependent on polluting energy resources such as fossil fuels. While some countries will continue to promote fossil fuels, developing countries should demand non-polluting products and increase climate finance flows to promote economic growth.

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