

# Private Sector Climate Finance After the Crisis

**Alexander Lehmann**

## Abstract

Climate investments in the emerging markets and developing economies (EMDEs) have so far fallen well short of what is required to meet targets set in the 2015 Paris Agreement. National commitments ahead of the 2021 UN climate summit will further underline the discrepancy. Climate finance in the EMDEs has been dominated by public sources and development funds, while private investors, local capital markets, and green banking became significant only recently.

This paper surveys the incentives for the provision of dedicated green financial products by private investors and lenders in EMDEs, and the related challenges for regulators. While green bonds and other portfolio investments have attracted much attention, in low-income countries, mobilizing private finance that addresses the climate challenge will need to rely on banks as the core part of the domestic financial system. This effort will need to be supported by better coordination with regulators in the advanced countries, and by making blended finance schemes more effective.

Center for Global  
Development  
2055 L Street NW  
Fifth Floor  
Washington DC 20036  
202-416-4000  
[www.cgdev.org](http://www.cgdev.org)

This work is made available under  
the terms of the Creative Commons  
Attribution-NonCommercial 4.0  
license.

## Private Sector Climate Finance After the Crisis

Alexander Lehmann  
Bruegel

Comments by participants in a seminar at CGD in February 2020, by Kathryn McPhail (Energy CC) and Ian Mitchell (CGD) are gratefully acknowledged. [Alexander.lehmann@bruegel.org](mailto:Alexander.lehmann@bruegel.org).

Alexander Lehmann, 2020. "Private Sector Climate Finance After the Crisis." CGD Policy Paper 182. Washington, DC: Center for Global Development. <https://www.cgdev.org/publication/private-sector-climate-finance-after-crisis>

**Center for Global Development**  
**2055 L Street NW**  
**Washington, DC 20036**

202.416.4000  
(f) 202.416.4050

**[www.cgdev.org](http://www.cgdev.org)**

The Center for Global Development works to reduce global poverty and improve lives through innovative economic research that drives better policy and practice by the world's top decision makers. Use and dissemination of this Policy Paper is encouraged; however, reproduced copies may not be used for commercial purposes. Further usage is permitted under the terms of the Creative Commons License.

The views expressed in CGD Policy Papers are those of the authors and should not be attributed to the board of directors, funders of the Center for Global Development, or the authors' respective organizations.

## Contents

Foreword .....	1
1. Introduction .....	2
2. Climate investment: potential and financing patterns .....	4
3. Green finance instruments in the EMDEs .....	8
Sustainable banking .....	10
Green bonds .....	10
Institutional investors focused on ESG criteria .....	15
4. Regulation of green finance and climate risks .....	16
Disclosure and taxonomies .....	16
Standards for the origination of green financial products .....	17
Climate risks and prudential regulation .....	19
5. Conclusions: policy priorities for mobilizing climate finance .....	21
Reform of domestic financial systems .....	21
Regulatory standards that keep international capital markets open .....	23
Private financing mobilized by the DFIs .....	24
References .....	26

## Foreword

As the world looks to recover from the economic crisis induced by COVID-19, there is an enormous opportunity to choose a “green” recovery—one that sets the stage for sustainable growth over the medium and long term. While the eventual benefits to this economic reset are now well-documented, it is also clear that an upfront investment is needed in sustainable infrastructure and renewable energy sources. The richest nations, notably those in the European Union and China, are putting in place a regulatory and supervisory framework to encourage and to track green investment. Yet the need for such investment is global, with a critical role being played by emerging market and developing economies (EMDEs). Great hope has been put in private financing fueling green investment, helping to reset the development paradigm in the years to come.

In this paper, Alexander Lehmann assesses whether the current global financial structures will encourage green capital flows to EDMEs. Overall, he finds that public investment in EDMEs is predominantly domestically financed and green capital flows play a tiny part in overall financing. While in principle appealing to institutional investors, who look to have a positive impact on a green recovery, the scale and scope of projects are as yet insufficient to attract large amounts of green capital to cross borders into EDMEs. Further development of domestic financial markets is needed and Lehmann urges multi-lateral development banks and other public institutions to play even more of a catalytic role than they are now doing. This is even more of a challenge in a post-COVID world where needs far outstrip the available public international resources. But finding ways for green investment to flow across borders to EDMEs will be essential to sustainable growth.

Mark Plant

Senior Policy Fellow

Center for Global Development

# 1. Introduction

In 2015, the Paris Agreement set binding targets for the reduction of greenhouse gas emissions to limit global warming to below 2 degrees. Since then emerging markets and developing economies (EMDEs) adopted strategies for reorienting their economies towards a low-carbon economy and are due to update these plans and offer more detail, ahead of the next UN climate summit in 2021. Significant investment in renewable energy and transport and other infrastructure has been planned to support this transition, while at the same time adapting to the inevitable adverse effects of a warming climate.

Development finance institutions (DFIs) and bilateral donors have already re-oriented lending to support the needed adjustment, also in the context of the much broader UN Sustainable Development Goals (SDGs), which were adopted only months before the Paris Agreement. Substantial gaps remain relative to the financing required to meet national investment plans.<sup>1</sup>

Numerous initiatives within the EMDEs now aim to attract private investors and lenders to fill these gaps.<sup>2</sup> In line with the significant role of the public sector, which still accounts for just under half of recorded climate finance, the literature on private financing is still relatively small.

This paper examines the information barriers and incentive problems that inhibit capital market transactions and private bank lending in green financial instruments. Regulations that are designed to address these problems are now proliferating, and in early 2020 25 countries had sustainable finance strategies in effect, or under preparation (IIF, 2020). At the same time, numerous initiatives by the DFIs seek to attract private climate finance to the EMDEs by offering to combine concessional finance or risk insurance. Both regulations and the blending of development finance have led to a certain fragmentation of climate finance across jurisdictions and asset types.

Up until 2019, there have been ample capital flows into the developing world. Emerging markets alone received about USD 300 billion in portfolio debt and equity, and over USD 500 billion in foreign direct investment from non-residents, and a growing number of low-income ‘frontier’ markets have similarly accessed international bond markets.<sup>3</sup> Investors were increasingly seeking assets that met either ‘green’ qualities, or which would impact the broader SDG goals. Despite this relative abundance of capital market funding to the EMDEs, private climate finance remains very limited, and, as we will show in later sections,

---

<sup>1</sup> The UN’s intergovernmental panel on climate change (IPCC) estimated that an average annual investment of USD 2,400 billion in the global energy system would be needed until 2035. Figures from the International Energy Agency suggest that in 2018 USD 1,800 billion was invested, of which only about one sixth was directed to low carbon investment.

<sup>2</sup> As for the SDG financing see the [UN Addis Ababa Action Agenda](#) of 2015.

<sup>3</sup> Figures quoted from Institute of International Finance (2020): Capital Flows Report.

largely originates from within domestic financial sectors, and in the low-income countries primarily from domestic banks.

The COVID-19 crisis in early 2020 is a clear setback for the climate finance agenda. Amid a global recession the price of oil has dropped to record lows, undermining the incentives for investment in renewables. The crisis has led to a sharp, if temporary, withdrawal of private capital. Low income countries will be particularly severely impacted and a moratorium of debt service to official sector creditors will raise uncertainty over private debt sustainability and capital market access. The recession and required health spending will constrain public expenditures at a time when the bulk of the needed climate investment was to take place, even though such expenditures could have a high multiplier effect in the recovery.<sup>4</sup>

Notwithstanding the deep global recession of 2020, the investment plans made under the Paris Agreement offer a path to build more resilient energy systems and infrastructure. As bilateral donors and development finance institutions are focused on the health crisis, the role of private investors and lenders in funding the transition will be elevated. Once capital market access is again more secure after the crisis, the changing interpretation of fiduciary duty will force investors reflect ESG principles to a much greater extent. The more elaborate regulatory standards and taxonomies that have emerged in China and the EU may well set a benchmark for green assets in other markets. Sustained capital market access by the private sector may require matching or at least compatible standards within the EMDEs.

Section II reviews the evidence on the gap between investment needs implied by national commitments, and the existing public financing sources, and traces the very limited cross-border flows of private climate finance. Section III then examines to what extent the principal instruments in sustainable finance – green loans, bonds and ESG-based portfolio investment – could be suitable in the typically under-developed financial markets of the EMDEs. Green finance primarily needs to be debt-based, in local currency, and offer long term maturities. This argues for building up capacity in local banking systems as a priority, not least because a significant expansion of the typically illiquid private bond markets in the EMDEs is not realistic in the short term. Section IV reviews how the regulation that has emerged most notably in the EU and China could be relevant for cross-border flows, and in domestic financial systems. Finally, Section V reviews three key policy priorities. In the light of the emerging regulatory framework for sustainable finance and global standards for disclosure there is an agenda for upgrading local banking systems, including by adapting supervision and private risk management to reflect adverse climate events. This could be complemented by a more active engagement of private investors partnering with the DFIs, and defining taxonomies and green bond standards that are consistent with those in emerging economies.

---

<sup>4</sup> Hepburn et al. (2020).

## **2. Climate investment: potential and financing patterns**

Portfolio and direct investors in developing countries allocate capital across competing jurisdictions and investment environments. To gauge the potential for private sector climate finance and assess priorities across different sectors, some measure of the shortfall between targets and committed public capital expenditures is needed. At present, private capital flows show little relation to such financing gaps.

One target emerged with the Sustainable Development Goals (SDGs). The 17 broad goals are articulated in an additional 169 targets, though did not feature the same detail and country-specific targets as were subsequently set out in the Paris Agreement. SDG no. 13 lists broad ambitions on climate resilience, and on domestic institutions and capacity to deal with natural disasters. SDGs 11 (sustainable cities), and 7 (clean energy) similarly relate to spending on infrastructure and buildings. Proxies for progress compiled by the UN show that gaps are larger for low income countries (Figure 1).

In total, the SDGs represent substantial additional spending commitments.<sup>5</sup> Climate-related investment under the SDGs will require wide-ranging transformations of national energy, transport and building stock, and of land use systems. Other studies estimate the annual costs of climate mitigation and adaptation at 20-40 per cent of current infrastructure spending prior to that same year (Schmidt-Traub, 2015).

Few SDGs are quantified, many are interlinked, and at times set conflicting goals, for instance between clean energy and affordable energy. For investors focused on climate finance the SDGs are unlikely to offer easy targets.

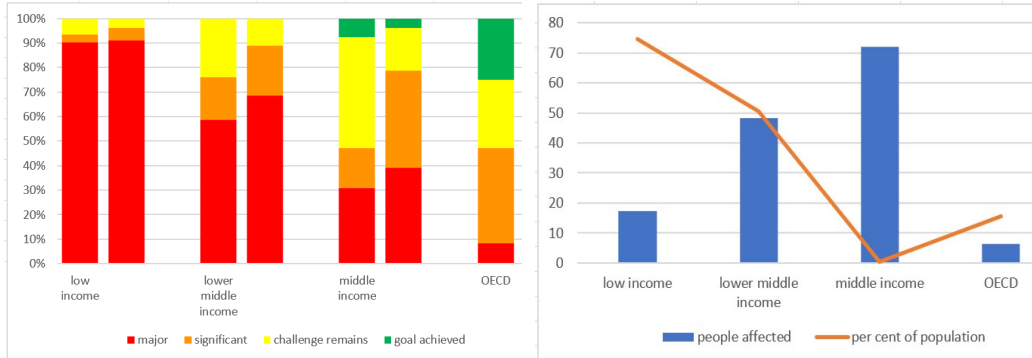
---

<sup>5</sup> For power, roads and sanitation infrastructure alone, the IMF (2019b) estimated additional annual expenditures of USD 1.4 trillion by 2030 for all low-income and emerging market economies, and an additional USD 1.2 trillion on education and health care.

**Figure 1. Indicators for two climate-related SDGs<sup>6</sup>**

a. Extent of challenges in SDG 7 (clean energy) by number of countries and population

b. People affected by climate-related disasters (SDG 13), in million, and per cent of population



Source: Sustainable Development Indicators, available at <https://unstats.un.org/sdgs/>.

By contrast, the Paris Agreement has already resulted in detailed investment targets in most EMDEs. It is a treaty that is legally binding on all its 196 signatories, which committed themselves to a pathway to a low carbon economy, consistent with a scenario of limiting global warming to 2 degrees. This transition will require the re-allocation of public capital expenditures into energy, urban and transport infrastructure, and an industrial and residential capital stock that is aligned with this goal for lower emissions of greenhouse gases. Based on the review of various studies, the International Panel on Climate Change (IPCC) estimated the required additional capital expenditures at about 1.5 per cent of global gross capital formation in the period up to 2035.<sup>7</sup>

Each country set out plans for mitigation and climate adaptation in the Nationally Determined Contributions (NDCs). These are essentially country-driven commitments to economy-wide reductions in greenhouse gas emissions and adaptation measures, which include sector-specific targets, for instance on the expansion of renewable energy capacity. There is a clear overlap with several of the 17 SDGs, and many countries have integrated the policy process for delivering on both sets of targets.

The early NDC submissions often lacked cost estimates. Few NDCs were sufficiently specific to give clear signals to investors, lacking detail on technologies and pathways envisaged by the government to achieve the goals (Zhou et al, 2018).

<sup>6</sup> The sustainable development indicators base gaps for SDG 7 on access to electricity and clean fuels; CO2 emission, and share of renewable energy in total energy consumption; SDG 13 is based on indicators related to carbon emissions, and exposure to adverse climate events.

<sup>7</sup> IPCC (2018).



In the absence of clear costing from countries themselves the NDCs can still be used to estimate investment needs and potential for private climate finance in individual sectors. One such exercise in IFC (2016) used the NDCs from 21 emerging markets and found the required investments at about USD 23 trillion for the period 2016-2030, roughly equivalent to the combined GDP of that group of countries at the time. Such exercises of course are beset by data gaps, for instance in sectors such as agriculture or land use, and by the inability to anticipate innovations or the cost of capital.

Apart from the unclear costing, most EMDE commitments have been conditional on external support being made available. In early 2020, just before updated NDC were due, 136 out of 168 countries still expected such support, with 74 countries requiring adaptation finance, and 104 mitigation finance (Pauw et al., 2020).

There has been a long-standing commitment, which the advanced countries first made in 2009, to mobilize USD 100 billion annually by 2020 from both public and private sources for climate mitigation and adaption investment in developing countries.<sup>8</sup> Accounting for such climate-related development aid has been contentious. Funds from bilateral and multilateral agencies, for instance, are highly fragmented in multiple instruments, and often offered on a regional basis. Having revised its accounting methodology a number of times the OECD in its latest estimate suggests that the advanced countries were converging to this target, with funds provided directly by development institutions at USD 54.5 billion in 2017, or mobilised through blended finance schemes from the private sector (at USD 14.5 billion).<sup>9</sup>

Even on the side of recipient countries tracking climate-related financial flows has been problematic. Climate finance in the EMDEs should include domestic spending on adaptation and resilience, even though expenditures within the household sector or the informal sector are difficult to measure.<sup>10</sup>

There are some attempts to record primary investment in climate mitigation and adaptation directly, which also allow to track the type of financing, and the source of financing by geographical region. Table 1 decomposes figures of CPI (2019), which recorded USD 579 bn. global climate investments on average in 2017-18<sup>11</sup>:

---

<sup>8</sup> This pledge was formalized in the Cancun Agreement of 2010, and the USD 100 billion target is to be raised by 2025.

<sup>9</sup> OECD (2019).

<sup>10</sup> Adaptation finance could be defined as ‘the cost of activities undertaken to lower the current and expected risks to or vulnerabilities of the project, community, economy or the environment posed by climate change.

<sup>11</sup> Figures exclude among others guarantees or insurance products, which are often part of climate finance volumes shown by the DFIs.

- Globally, private sources account for just over half of total climate finance mobilized (56 per cent). Among public sources, national development banks and multilateral development banks dominate, while direct budget funding is marginal.
- The vast majority of investments were directed at climate mitigation. Climate, adaptation – a key element of investment plans in EMDEs and in particular low-income countries – accounted for little over 5 per cent of recorded total finance mobilized, and was almost entirely funded by the public sector.
- 61 per cent of global climate investment was mobilized for projects in non-OECD countries, and within this group mainly in China. Of total climate finance for projects in non-OECD countries between one fifth and one third was derived from cross-border flows. The limited international flows of climate finance originated primarily in the OECD countries (USD 82 billion, or 15 per cent of the global total, flowed from OECD to non-OECD countries). OECD estimates reviewed earlier suggest the bulk of this figure stemmed from development institutions or private finance mobilized in blended finance schemes. Even though the origin of several types of private climate finance cannot be tracked this suggests that private investment in developing country low carbon projects that is independent from development finance, is as yet marginal.

**Table 1. Climate finance flows (USD billion)**

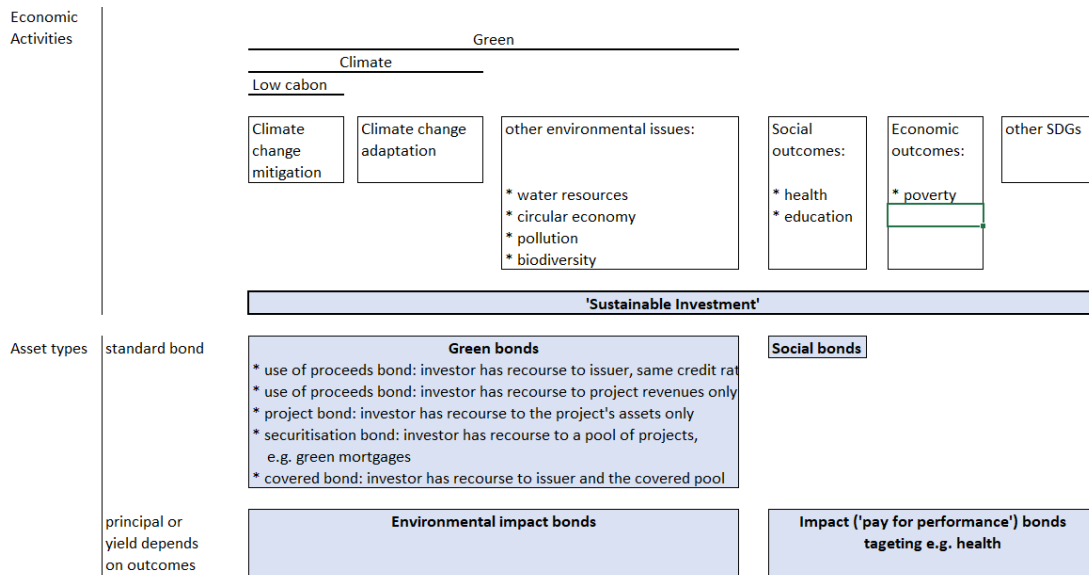
by sources or intermediaries of capital for climate finance			by region of origin and destination		
	2017	2018		2017	2018
PRIVATE	330	323	DOMESTIC	484	391
Commercial FI	76	69	Non-OECD	321	209
Corporations	193	172	OECD	164	182
Households	45	66	INTERNATIONAL	127	155
Institutional investors	9	10	From Non-OECD to Other Non-OECD	18	21
Private equity, venture capital, infrastructure funds	4	6	From Non-OECD to OECD	4	3
other	2	0	From OECD to Other OECD	43	49
PUBLIC	282	224	From OECD to Non- OECD	62	82
Government Budgets & Agencies	32	42	TOTAL	612	546
Climate Funds	3	4			
Public FI - Bilateral	20	26			
Public FI - Multilateral	56	58			
Public FI - National	171	94			
TOTAL	612	546			

Source: Climate Policy Initiative (2019).

### 3. Green finance instruments in the EMDEs

Private climate finance has long been offered through standard bank lending and project finance. Financial instruments that are labelled as ‘green’ are a much more recent and as yet less significant source of finance in the EMDEs. As Figure 2 underlines for bonded debt, such instruments are aimed also at other environmental objectives, such as biodiversity or pollution abatement. Impact investing originates from a distinct investor group, and also different bond structures, and remains a relatively small part of the sustainable investment universe.

**Figure 2. Types of sustainable investment and bond instruments**



Source: UN and Climate Bonds Initiative.

While green bonds can be easily tracked in capital markets, lending by banks to the low-carbon transition is more significant and subject to much more varied standards. Financing flows in labelled bonds and loans as depicted in Figure 3 of course understate the true scale of climate finance in both categories.

Financial policy that seeks to develop funding for mitigation and adaptation investment will need to aim at the financing conditions for a typical green investment project, not necessarily at individual instruments. This could be an energy or infrastructure project with a protracted project construction phase, and an extended phase of utilization. In sectors such as renewable energy, the project size may be small relative to typical bond financing, and the quality of disclosure by the project sponsor may vary greatly. External project finance is

primarily in the form debt, will need to be in local currency and offer a sufficiently long maturity to match the project’s revenue stream.<sup>12</sup>

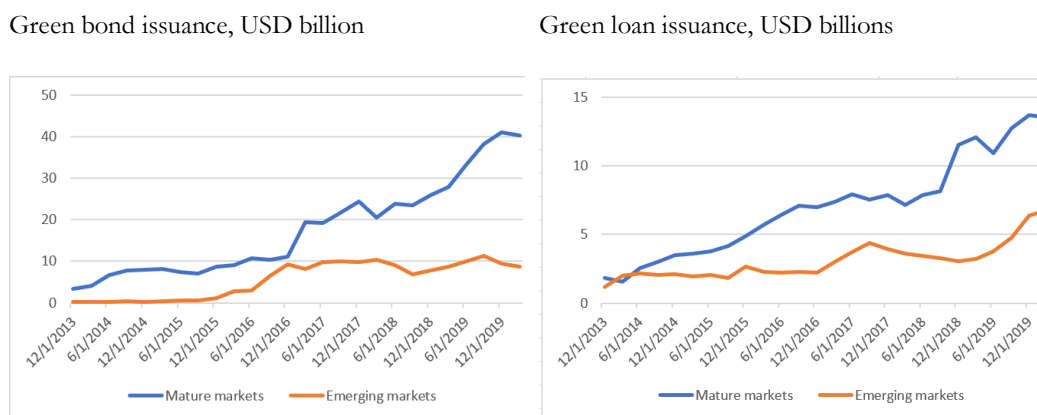
Any debt contract needs to deal with inadequate disclosure by the borrower (‘information asymmetry’) and moral hazard which undermines the borrower’s conduct to the lender’s detriment. In financing a green project, the lender seeks additional non-financial qualities in the use of proceeds, so both problems are more pronounced.

The market failures and policy distortions are more prominent in underdeveloped financial systems. Lenders typically respond by shortening of loan maturities, which offers the option to exit and control contracts, though this is not suitable for infrastructure and energy finance.

Disclosure by a borrower is likely to work well for loans from a bank which is in an established relationship with the borrower. It is more problematic in a bond prospectus that forms the contractual basis for funds offered by dispersed investors unfamiliar with the project sponsor. For both loans and bonds a dedicated private industry needs to emerge to provide sustainability assessments and verify the use of proceeds and impact.

Once the funds are disbursed, the lender or investor will need to effectively constrain the conduct of the project sponsor. ‘Greenwashing’ denotes misleading disclosure or conduct by the borrower that deviates from earlier commitments. Unlike for financial covenants in a loan contract or bond issue, investors have no obvious sanction where earlier commitments on environmental outcomes are not delivered on. Banks originating green loans or investors in green bonds will need to rely on periodic reporting and verifications that are more detailed than for standard credit monitoring, and for which local standards need to be developed.

**Figure 3. Issuance of green bonds and loans, 2013-2019**



Source: Institute of International Finance (IIF), based on BNE; 4 quarter moving averages.

<sup>12</sup> OECD (2017).

## **Sustainable banking**

Unlike for green bonds, there is no single definition as to which bank loans meet an environmental standard. Taxonomies that classify certain exposures as sustainable are still poorly developed in the EMDEs, and categories are often based on national priorities and local climate challenges.<sup>13</sup>

At the lower end of estimates, and based on flows figures depicted in Figure 3, the stock of outstanding green loans in the EMDEs amounted to USD 88 billion in early 2020, roughly half of the corresponding amount in mature markets. At the same time, banking sectors in many EMDEs are subject to some form of sustainable banking standard, either based on an industry-led initiative, or through guidance by the supervisor, as set out in the next section. The International Finance Corporation (IFC) has worked with many private banks and industry bodies and based on a survey of clients in the 21 largest markets estimates that about 7 per cent of loan portfolios of loan stocks are aligned with climate targets.<sup>14</sup>

An established lending relationship can address the dual challenges of disclosure and disciplining borrower conduct. Unlike a single investor in the capital markets a bank will have ready access to the borrower's credit history and other non-financial information, and will be able to ensure that borrower behaviour aligns with targets. A branch network can in principle access a wide group of households and microentrepreneurs where investment in climate adaptation is required, and various DFI lending facilities have utilized banks to access such borrower groups.

Climate projects are often too small for funding by large institutional investors in capital markets where investors seek financial markets and instruments that are liquid. Banks can play a useful role in implementing uniform standards, and aggregating assets. In developed markets sustainable bank loans are regularly combined into portfolios that back a securitized green bond issue by the originating bank.<sup>15</sup> This refinances green lending, relieves the bank of the underlying risk, and develops green instruments in the local capital market. In the EMDEs the lack of a standardized taxonomy and transparency of the underlying borrowers is still an obstacle to developing such instruments.

## **Green bonds**

Green bonds have been a rapidly growing instrument of climate finance in emerging markets up to 2019. The World Bank and other development finance institutions were the first to design and issue green bonds from 2007. By now, a wide range of corporate and financial institutions, and increasingly sovereigns and other public institutions, are regular issuers.

---

<sup>13</sup> One of such very open standard is the [Green Loan Principles](#), drafted by the Loan Market Association. For instance the standard lists only an indicative set of eligible sectors, and external review is only recommended.

<sup>14</sup> IFC (2016b).

<sup>15</sup> Over the past three years asset backed securities amounted to about 70 per cent of green bonds issued by financial institutions.

Green bonds are essentially standard bonds that offer enhanced transparency on the use of proceeds. The designated green projects and assets, not the quality of the issuer, distinguishes the instrument. Up to now, verification has been based on two private standards developed in the UK, and one promoted by the People's Bank of China.<sup>16</sup> In the EU this is set to be formalized through regulation, which will be largely based on the private standard that has gained the broadest market acceptance.

In early 2020, a total of USD 633 billion in green bonds were outstanding under any one of these standards, of which about a fifth had been issued by EMDEs.<sup>17</sup> China, which has its own certification standard, accounted for two thirds of the issuance within EMDEs. There are also small amounts outstanding in other bond instruments linked to sustainability objectives, such as social or impact bonds, though these are not significant in emerging capital markets.

Issuers are obliged to disclose detailed information on the use of proceeds and periodically report on progress with the project. Reports to investors on the use of proceeds following the issuance, let alone on the *impact* of funded projects, are subject to loose standards and highly variable.<sup>18</sup> Even though discipline exercised by the investor over the borrower subsequent to the issue is relatively weak, empirical studies suggest that the process of verification leads to an improvement in environmental performance of corporate issuers (Flammer, 2020).

Green bonds typically allow the investor recourse to the assets of the sponsor or issuer in the event of a default. There are alternative structures, such as project bonds and revenue bonds, where the bond is backed by the cash flow generated by the project or its balance sheet, though these structures are less common, and they would require more elaborate documentation and monitoring (Figure 2). There are two implications from this common 'issuer recourse' structure.

First, the green bond investors bear the same credit risk as investors in a regular bond. The fact that most green bonds nevertheless command a slight premium (lower spread) at the time of the issuance is due to a dedicated investor base which makes the primary issuance ('bookbuilding') process more predictable, resulting in a higher degree of oversubscription. In secondary trading pricing between green and standard bonds seems to be closely aligned.<sup>19</sup>

Second, the bond proceeds are part of a broader funding programme of the issuer. They are associated with a climate related project, though ultimately fungible within the balance sheet of the sponsor. Mechanisms of allocation will only be credible in the context of strong

---

<sup>16</sup> The most common European standards are the Green Bond Principles of industry group ICMA, and the standard defined by NGO Climate Bonds Initiative.

<sup>17</sup> Figures are based on IIF database of sustainability loans and bonds, released May 2020.

<sup>18</sup> CBI (2018) found that less than half of issuers report on both use of proceeds and impact following the issuance. The exception are of course multilateral and national development banks.

<sup>19</sup> Ehlers and Packer (2017), confirming earlier studies. See also CBI (2019).

corporate governance frameworks and local accounting standards. This problem in attribution of the use of proceeds elevates the role of private sector verification services, which are generally underdeveloped in the EMDE markets.

### **Which sectors are likely to attract investors?**

Green bonds are as yet a marginal instrument for financing infrastructure projects in the developing world. Only about a quarter of cumulative green bond issuance has been directed to non-financial enterprises, with half of total volumes issued by banks and other financial institutions, and a further quarter by governments, public institutions and supranational institutions within these markets. Data from the leading certification standard provider also suggest that the limited issuance of green bonds by EMDEs was primarily done in hard currency (with euro and dollar-denominated issues accounting for 71 per cent of issuance volume in 2018), which may have raised currency risks among EMDE issuers.

EMDEs often lack a deep local investor base, such as pension funds, for bonds issued under local law and in local currency. A corporate issuer can in principle place a bond directly with individual local investors. However, where local capital markets are illiquid the yield for both marketable and privately-placed instruments will reflect a premium and result in less attractive financing costs. Where an enterprise has already issued bonds it may be reluctant to erode liquidity in outstanding securities through the issuance of a new type of instrument. As in other capital market instruments, smaller issuers appear to have faced problems accessing institutional investors.<sup>20</sup>

By contrast, governments may overcome the inherent illiquidity of corporate green bonds, by issuing within their local or foreign sovereign bond markets, and by accessing a much wider and established investor base through the primary auction process.

Sovereign green bonds are a very recent phenomenon. The governments of Poland and France were the first to issue such bonds in 2016-17, and in the case of France a substantial USD 25bn. issuance programme was based on an elaborate programme of environmental projects. Since then, sovereign green bonds have been offered by at least six EMDE central governments, of which four have issued repeatedly (Table 2). Indonesia, Chile and Nigeria could rely on local investors, and Nigeria issued two smaller instruments in local currency on its local market in 2017.

The total amount raised up to mid-2020 through sovereign green bonds of about USD 11 bn. is small compared to the total volumes raised on local and international sovereign bond markets (net non-resident flows of portfolio debt to emerging markets were about USD 270 billion in 2019 alone). Some countries would clearly like to present their bond market funding programme as supporting sustainable growth, given that capital market access is more uncertain in the current recession and any future recovery. Funds raised through the sovereign green bonds were generally supportive of investment and of targets in emissions

---

<sup>20</sup> PRI (2018); and EU Commission (2018).

reductions prescribed under the NDCs, though documentation provided to investors as part of the issuance process seems to have set more detailed targets, which were subject to external verification.

At the same time, there is no conclusive evidence whether green bonds awarded a yield discount to the issuers.<sup>21</sup> Unless it is based on an existing policy framework, a sovereign green bond essentially may entail an earmarking of budget funding. A similar problem arises for impact bonds where proceeds are tied to other development outcomes, such as the SDGs.<sup>22</sup> This may crowd out other expenditures, and possibly come into conflict with expenditure policy agreed with donors or in policy-based lending.

---

<sup>21</sup> Of the eleven issues studied by the Climate Bonds Initiative, as many obtained a pricing benefit, as had to pay a premium over rates inferred from the existing yield curves.

<sup>22</sup> Among these plans was an bond framework in Mexico that would have tied proceeds to localities with large gaps in the SDGs: [https://gsh.cib.natixis.com/our-center-of-expertise/articles/mexico-s-sdg-bond-framework-a-two-fold-eligibility-and-unique-governance#container\\_16891417](https://gsh.cib.natixis.com/our-center-of-expertise/articles/mexico-s-sdg-bond-framework-a-two-fold-eligibility-and-unique-governance#container_16891417).



**Table 2. Sovereign green bonds issued in the EMDEs**

	First issue	Total volume, (USD, unless otherwise stated)	Total number of issues	Longest maturity in years	
Chile	2019	6.2 bn	4 (two issues were reopened)	31	<ul style="list-style-type: none"> <li>• Investor base was broadened, including to specialist ESG funds in Europe.</li> <li>• Mix of USD and EUR, lowest yield ever at 30 year maturity</li> </ul>
Hungary	2020	EUR 1.5 bn	1	15	<ul style="list-style-type: none"> <li>• Largely used for railway rehabilitation</li> <li>• Verified through the alternative ICMA standard</li> </ul>
Indonesia	2018	2 bn.	2	5	<ul style="list-style-type: none"> <li>• Finances a range of projects set out in the NDC</li> <li>• Sequestration of proceeds in the treasury</li> <li>• Sukuk structure</li> </ul>
Nigeria	2017	41 m. (local currency)	2	5	<ul style="list-style-type: none"> <li>• Projects as set out in the NDC</li> <li>• Bond listed on local stock exchange</li> </ul>
Fiji	2017	47.7 m. (local currency)	4	13	<ul style="list-style-type: none"> <li>• Eligible expenditures also include tax credits to mobilize other private capital</li> </ul>
Seychelles	2018	15 m.	1	10	<ul style="list-style-type: none"> <li>• International investors</li> <li>• Partial credit guarantee by the World Bank</li> <li>• Grants supported transaction costs</li> <li>• Concessional financing blended from donor fund</li> </ul>

Source: Climate Bonds Initiative.

## **Institutional investors focused on ESG criteria**

Among the mutual funds invested in emerging markets, those with an explicit focus on ESG criteria have grown particularly rapidly. By end 2018, such funds made up about 10 percent of dedicated emerging market funds, at roughly USD 20 bn.<sup>23</sup> The potential is significant, as a growing number of asset managers sign on to one or several ESG codes. The UN-sponsored Principles for Responsible Investment, for instance, in 2020 was supported by over 3,000 asset managers, even though exact commitments by signatories, and impact on their asset allocation under such codes is often not clear.

These funds for portfolio debt and equity may include certified green bonds, though typically capture a much broader range of securities whose issuers have been screened for ESG compliance in some form. The fiduciary duty of fund trustees towards the asset owners or beneficiaries generally requires a review of invested assets for ESG principles.<sup>24</sup> However, asset managers employ widely different processes and standards to integrate ESG assessments in investment analysis. ESG alignment may simply involve excluding certain types of firms (e.g. due to labour practices, or corporate governance), or highly carbon-intensive sectors.

Crucially, this asset class is not directly aimed at financing climate investment, and the screening process by the fund manager rarely targets specific activities. It is often based on ESG ratings provided by commercial providers, and governance, rather than environmental considerations, plays a key role. Unlike for green bonds, ESG compliance could cover a broad range of acceptable issuers and activities, and there is no uniform taxonomy.

In any case, such type of portfolio investment is of limited value for climate related projects, which will require early-stage project funding, whereas listed companies accessible to ESG investors will be more mature, with sufficient disclosure, sound corporate governance and limited risk. Institutional investors will normally be focused on only those emerging markets with liquid local capital pools.

---

<sup>23</sup> Citi Research.

<sup>24</sup> UNEP FI (2019).

## 4. Regulation of green finance and climate risks

To date, sustainable finance bonds and loans have emerged with limited regulatory encouragement, and climate risks in the financial sector have been only lightly scrutinized.

Since about 2015, the case for regulation has been made on two grounds. Firstly, climate risks present a risk to financial stability, and therefore warrant attention by prudential supervisors. Where financial firms do not take climate change into account their assets will be exposed to an abrupt repricing of carbon intensive assets (transition risks), or to the physical risks of adverse weather events. In the absence of prudential regulation and supervision local communities and financial sector assets will be more exposed to climate change.

Secondly, the stated policy objective that green finance is generated by banking systems and capital markets requires common classification systems and standards defined by regulation. To date, many such standards have emerged through private providers and initiatives. However, ‘greenwashing’ by individual investors or project sponsors could undermine the credibility of the entire green finance asset class.

The main planks of green finance regulation are now being put in place, and emerging and developing economies increasingly adopt international standards, for instance on corporate disclosure, or models from individual jurisdictions, such as the EU’s green bond standard. EMDEs also begin to participate more actively in the rule-making effort, and about 18 EMDE regulators have joined in the *Network for Greening the Financial System* that has defined principles for the regulation and supervision of climate risks in the financial system.

### Disclosure and taxonomies

To support borrower disclosure, and lending that is aligned with climate targets, the G20 Task Force on Climate Related Financial Disclosures (TCFD) made wide-ranging recommendations in 2017. Financial firms and large enterprises are to disclose metrics and targets for their climate exposures, and establish internal governance, strategy and risk management to track and reduce such exposures. This is now gradually implemented in the advanced countries, in the EU for instance in the form of the non-financial reporting directive.<sup>25</sup> However, a stocktake of implementation suggests that the TCFD’s standards will be challenging for all but the largest firms in the EMDEs.<sup>26</sup> Corporate governance systems are often weak, and tracking emissions is difficult where no comparable standards exist among energy suppliers or elsewhere in the value chain.

A second objective in regulators’ quest for greater transparency is a common delineation of which economic activities are seen as sustainable, and could hence be included in green financial products or incentive schemes. A so-called taxonomy for sustainable activities was a

---

<sup>25</sup> See: [Guidelines on reporting climate-related information](#).

<sup>26</sup> TCFD (2019).

central deliverable under the EU regulatory programme and will be binding for large EU financial firms, and EU member states from 2021.<sup>27</sup> This is the most advanced classification system to date, with the only meaningful alternative model defined by the People's Bank of China.<sup>28</sup> The EU's taxonomy will therefore be key in defining the attractiveness of EMDE green assets to investors from the EU, and possibly elsewhere.

The EU regulation essentially sets screening criteria for those activities which make a contribution to environmental objectives. As yet, criteria for 70 climate mitigation activities and 68 adaptation activities have been defined. Activities supporting the other four objectives will be published later and may present trade-offs.<sup>29</sup> A firm will be considered 'taxonomy-aligned' based on the proportion of taxonomy activities in total turnover. Certain activities are aligned by definition (for instance wind powered energy generation), others only if they meet certain technical thresholds.<sup>30</sup>

The taxonomy has a number of inherent flaws which may limit its adoption outside the EU. A first is the somewhat rigid definition of environmental activities and of technical criteria within individual sectors. The taxonomy offers no recognition of intermediate technologies that hold some benefit in reducing greenhouse gas emission, though which are not considered 'green'. Also, innovation may render some criteria obsolete and may overtake the continuous review planned by the EU. Climate issues in the EMDEs, such as local water and air pollution, may require very different sectoral activities and criteria. Second, the taxonomy essentially remains agnostic on the impact which aligned financing will have on the recipient. That impact could arise from lowering the cost of financing, improving liquidity and refinancing options, reforming the conduct of the firm in incorporating climate risks, or spill-overs to other actors in the industry.<sup>31</sup> Finally, the taxonomy could create tension with other jurisdictions if EU plans to define 'brown' assets were to be implemented with a view to penalizing or excluding certain exposures by the financial sector.

## **Standards for the origination of green financial products**

The EU taxonomy will be fundamental to a number of other standards and EU financial markets. An immediate application was the definition of EU benchmarks for portfolio investors. These are designed to help institutional investors, such as pension funds, to assess

---

<sup>27</sup> EU Technical Expert Group on Sustainable Finance (2020).

<sup>28</sup> Green Bond Endorsed Project Catalogue (2015 edition) issued by the Green Finance Committee (GFC) of the China Society for Finance and Banking. Mongolia also has its own taxonomy, and seven other countries are in the process of developing one: Canada, Mexico, Colombia, South Africa, New Zealand, Japan and Malaysia.

<sup>29</sup> These are protection of water resources, transition to a circular economy, pollution and biodiversity.

<sup>30</sup> The activity also must not do significant harm to any of the other environmental objectives, and will need to meet certain safeguards, such as labour or governance standards, though both checks would need to be done by the investor.

<sup>31</sup> Ben Caldecott: [Investing in Green doesn't equal greening the world.](#)

the exposure of entire portfolios to climate risks, and for certain other asset managers to offer portfolios that target a demanding carbon reduction.<sup>32</sup>

In mid-2019 the EU also released its proposal for a green bond standard. This standard may be less flexible than the private standards used to date, which have adapted continually to technological change and innovation. For instance, funds raised through a green bond would have to be used for activities set out in the EU taxonomy, and accredited private providers would need to verify the borrower's activities.<sup>33</sup>

Several emerging markets have also established their own local standards for bond issuance (Table 3).<sup>34</sup> These are typically designed for the local investor base and classification systems which reflect national priorities and investment plans. Investment funds with an ESG mandate from developed countries may ultimately use the EU standard.

The Chinese bond standard is the only rival format that has been used more widely in emerging markets (IMF, 2019a). There are large overlaps between the EU taxonomy and the People's Bank of China Green Projects Catalogue which defines assets and projects that are eligible for green bond financing. The Chinese catalogue contains some activities such as certain fossil fuel projects (clean utilisation of coal), and transport projects based on fossil fuel, which are not covered in the EU, and relative to the EU standard excludes certain processes in the supply chain of green projects (CBI, IISD and UK FCO, 2016).

---

<sup>32</sup> A 50 per cent reduction relative to the overall investable universe reflects the 'Paris-aligned' benchmark, a 30 per cent reduction with the less demanding EU Climate Transition Benchmark.

<sup>33</sup> It would also set standards for external verification services. Verification would be mandatory for the initial allocation of proceeds, though there are weaker standards for the ultimate impact of funds raised, and for commitments by the issuer itself (rather than those defining the project). Legislation is considered, though not imminent.

<sup>34</sup> Additional rules are being drafted in Egypt, Jordan, Lebanon and Tunisia.

**Table 3. Green bond rules in emerging markets**

Regulations issued by supervisory authority	Green bond listing requirements on the local stock exchange	Private sector initiatives
<ul style="list-style-type: none"> <li>• ASEAN</li> <li>• China</li> <li>• India</li> <li>• Malaysia</li> <li>• Morocco</li> <li>• Nigeria</li> </ul>	<ul style="list-style-type: none"> <li>• Chile</li> <li>• Kenya</li> <li>• Mexico</li> <li>• Peru</li> <li>• South Africa</li> </ul>	<ul style="list-style-type: none"> <li>• Brazil</li> </ul>

Source: Climate Bonds Initiative.

### **Climate risks and prudential regulation**

The ambition to mobilize climate finance from within domestic markets is now set out in numerous sustainable finance strategies in the EMDEs. These documents are typically produced by supervisors with input from the local industry and set broad goals and guidance for the private financial sector, at times offering incentives for innovative financing transactions. They do not normally constrain risk management or loan origination. Assessments by the IFC of 22 EMDEs with such strategies found that most reference the national NDC goals. Apart from China, IFC ranked only Indonesia as having an advanced strategy, with sustainability reporting requirements, green loan definitions, and a local green bond framework (IFC, 2019 and 2020).

Based on the gradual adoption of disclosure standards, financial sector supervisors in a small number of developed countries have already reflected climate risks in prudential regulation and the supervision of financial institutions. Greater scrutiny by supervisors is primarily aimed at penalizing certain ‘brown’ activities which are exposed to physical risks within the country, or whose carbon footprint exposes them to a repricing of asset values as the transition to a low carbon economy progresses. For instance, the valuation in bank balance sheets of so-called stranded assets, such as carbon-reserves, is likely to be at odds with commitments to reduce carbon emissions. Banks and large institutional investors are hence exposed to an abrupt repricing of assets, which presents a risk to financial stability.

Where a financial supervisor sets higher capital requirements to reflect climate risks this may result in higher financing costs, and reduced refinancing opportunities for activities with a high carbon footprint. Financing conditions for climate-related investment may improve as a result, though this is generally not a direct objective of prudential supervision. A discount on capital requirements for ‘green’ assets has also been proposed by some regulators. This may

be more problematic as sustainable activities may be exposed to high credit risks, as for instance witnessed in the solar panel industry.

Only some emerging market supervisors scrutinize climate risk. For instance, the Brazilian supervisor has made risks from carbon exposures part of its regular dialogue with banks. In Peru, banks are required to perform enhanced due diligence on project finance transactions, including to analyse environmental risks.

## **5. Conclusions: policy priorities for mobilizing climate finance**

Substantial additional fiscal expenditures are being marshalled to counter the 2020 recession in the developing countries. These measures can show the intended high fiscal multipliers, and preserve jobs and businesses, while at the same time sustaining progress towards national targets for a low-carbon economy (Hepburn et al, 2020). Longer term climate policy commitments should guide fiscal policy throughout the recovery phase.

The decline in energy prices in 2020 may provide an opening for the further elimination of fuel price subsidies and adoption of efficient carbon prices. These subsidies were estimated by the IMF at 6.5 percent of global GDP in 2017, with a major part being provided by the EMDEs, in particular east Asia. Adopting an efficient carbon price that reflects externalities could define incentives to create projects in renewable energy, delivering on national targets in emission reductions, while also addressing local environmental issues, such as air pollution.

A second key policy ambition could be the reform of the investment environment that will help generate more projects of a consistent high quality. Only where corporate accounts are transparent and reliable, and where creditors rights can be enforced, will low-carbon projects emerge that are ultimately attractive to funding in the capital markets. Green infrastructure funds or asset-backed securities could be instruments to aggregate numerous small projects, creating the scale that is sought by investors.

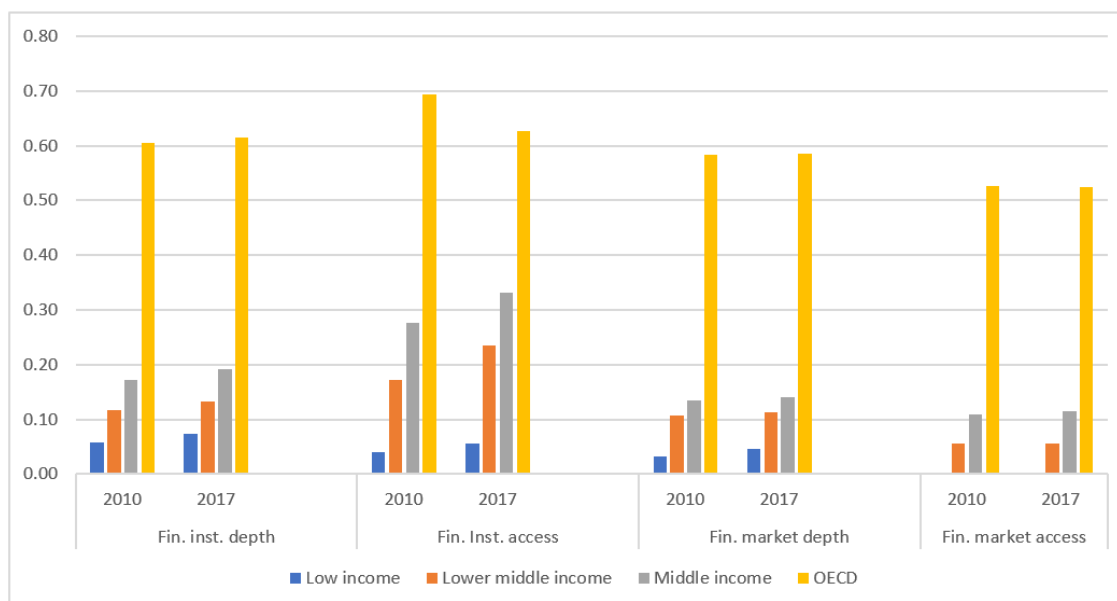
Once international capital markets re-open to all EMDEs, local sustainable finance principles may be a crucial differentiating factor, allowing access to a wider investor base. Aligning incentives in the domestic financial system with national climate goals is an agenda first and foremost for national prudential regulators and supervisors. It will also require coordination with rule-making in the developed countries, and leveraging concessional finance and risk sharing available from development finance institutions.

### **Reform of domestic financial systems**

For most EMDEs domestic bank credit will remain more important than capital market finance as source of climate finance. For the group of low and middle-income countries the ratio of bank credit to GDP is roughly twice as large as that of market capitalisation, and Figure 4 also underlines that access to bank finance is more developed for bank finance in all country groups. As a rapid expansion of capital market depth is not realistic, the sheer size of banking assets relative to capital markets dictates that banks be made the priority for developing local sources of climate finance.



**Figure 4. Measures of depth and access to financial institutions and markets<sup>35</sup>**



Source: IMF index of financial development.

Adopting sustainable banking principles remains a key agenda for many EMDEs, even though in the 2020 recession banking sectors have been impacted by rising loan defaults, which will constrain credit flows and may discourage innovation (IFC, 2020). World Bank surveys suggest that the capacity of supervisors to implement more in-depth scrutiny of climate risks in bank loan portfolios and of lending practices has improved. When supervisors engage banks on this topic, they may find that governance and disclosure standards remain poor, and may even have deteriorated since the last financial crisis (Angine et al., 2019).

Financial institutions and large enterprises in the EMDEs should nevertheless be encouraged to adopt disclosure standards as set out in the original G20 recommendations. The strengthening of risk management and governance in banks is likely to have benefits for financial stability more broadly.

Technical assistance by the DFIs aimed at upgrading national sustainable finance frameworks could be mainstreamed into financial sector adjustment programmes. In addition, the regular financial system surveillance by the IMF and World Bank could review progress on green finance more consistently, and in a broader set of countries. This could be complemented by capacity building within local banking sectors, for instance on risk management, offered by the IFC and other private sector lending facilities. Scrutiny by local

<sup>35</sup> Financial institutions depth reflects an index between 0 (lowest development) and 1 (highest) of private sector credit and other assets; access reflects availability of banking services; financial market depth is an index composed of various types of securities relative to GDP; financial market access reflects smaller companies' capitalization and number of issuers. Unweighted averages within country groupings.

supervisors and in voluntary peer comparisons by international institutions could help restrain credit flows to carbon intensive industries, and stimulate it in others that are aligned with national climate goals.

Numerous EMDEs are also committed to developing green assets within their domestic capital markets, as for instance expressed in the 2016 ‘Marrakech Pledge’ of 25 African countries.<sup>36</sup> Funding through green bonds can be mobilized where the broader challenges in the development of liquid local currency bond markets are addressed. Investors would fund projects with an extended payment stream, so would need to offer long maturities and local currency. There will need to be a sufficiently deep local investor base, ideally in the form a pension fund and a variety of other institutional investors. On the issuer side, high standards for disclosure and corporate governance would be doubly important.

### **Regulatory standards that keep international capital markets open**

The overwhelming majority of climate mitigation efforts in the early NDCs of the EMDEs is conditional on additional finance being provided. Funding from the advanced country development funds, and mobilized private funding, have addressed this shortfall, though still falls short of the earlier commitment. A new set EMDE national commitments ahead of the next UN climate summit will likely expose a persistent funding shortfall. Cross-border private investors could help address this gap. The jurisdictions with the largest green finance markets, importantly the EU and China, will now need to make sure their respective standards do not create additional barriers for climate investment in the EMDEs.

Recipients of green finance from the advanced countries, for their part, need to ensure their low-carbon projects are attractive to local and international investors in equal measure. Consistent standards in investment conditions and disclosure by project sponsors would allow the aggregation of numerous small projects into funding opportunities of a size that is attractive to institutional investors.

The EU is most advanced with its sustainable finance agenda, though has not sufficiently reflected on the implications of the regime for its substantial capital outflows. One venue for coordination could be the International Platform on Sustainable Finance which the EU initiated in 2019. In this forum the EU partners with twelve other economies, including China, India and Indonesia. Jointly this group accounts for nearly half of global greenhouse gas emissions, of which the EU accounts for only 10 per cent. So far, the agenda has been limited to sharing and comparing national initiatives.

EU investors and cross-border banks will increasingly be bound by taxonomies that define green activities. Several other advanced and emerging markets use their own taxonomies, most notably China. These classification systems will reflect local investment priorities, importantly in climate adaptation, and local environmental issues such as pollution.

---

<sup>36</sup> <http://marrakechpledge.com/>

There should be common design principles for taxonomies, though which activities benefit from incentives may well differ across jurisdictions. A key deliverable for EU coordination with other countries could be to ensure that financial products originated under EMDE standards remain eligible for green funds structure by EU asset managers or for loan refinancing. Advanced countries and their development agencies may be able to support the implementation of disclosure standards, which are key to guiding investors and financial institutions.

Also, the key actors in the international climate finance agenda should work towards high and robust standards for the origination of green assets which will address the risk of 'greenwashing' that is inherent in this market. While the targeted activities may differ, the verification and monitoring of the use of proceeds and impact could well converge to a common rigorous standard.

A number of EMDEs also participate in the international forum that seeks to address the financial stability implications of climate change. The current agenda of this group seeks to gauge climate risks in the financial system through common climate scenarios and stress tests. This work may well underline that the risks of the climate transition and of more frequent adverse weather events are not sufficiently reflected in banks' capital as required under present frameworks. Adjusting capital requirements to reflect climate risks could in the first instance be addressed through dialogue between supervisors and individual banks. A binding international framework that revises the standards set by the Basel Committee of Bank Supervisors does not appear feasible, nor effective, in the near term.

### **Private financing mobilized by the DFIs**

The official development institutions seek to catalyse the private sector into financing climate goals and the SDG through a variety of blended finance schemes. These generally offer to private investors a mix of guarantees, concessional debt or equity contributions. A recent OECD study identified 195 blended finance funds with USD 42 billion in development finance currently available. The World Bank's Global Environment Facility for instance claims to have leveraged its USD 700 million investment by a factor of ten.

While leveraging private sector finance is on the surface attractive, a stocktake suggests overall these initiatives are too fragmented and lack scale for them to become self-sustaining. Investors suggest that risk mitigation instruments financing by the DFIs in local currency and of early stage projects are particularly needed. Capital market funding, in particular by international investors, is offered at a scale that exceeds that of numerous small clean energy projects that are currently seeking finance. Against this background, the proliferation of donor activities seems to be a concern (CPI, 2018). Development agencies often appear challenged by interacting with private investors. Different investor groups seek financial instruments that appeal to their specific mandates, investment horizons and risk

tolerance, and international diversification.<sup>37</sup> A risk is that proliferating donor schemes crowd out or discourage independent private activity (Business and Sustainable Development Commission, 2017).

Various emerging market banks suggest that where incentives for the private sector are well defined, a portfolio of green bank loans can be created without public sector interest subsidies or risk sharing. The blending of donors' concessional finance with private commercial funds should therefore also create the private sector incentives and skills that build self-sustaining green banking businesses. This will depend on a conducive investment environment, a reliable designation of encouraged activities, and a private market infrastructure that fosters good disclosure and transparency.

---

<sup>37</sup> Business and Sustainable Development Commission (2017).

## References

- Angine, D, A. Bertay, R. Cull, A. Demirguc-Kunt and D. Mare (2019): Bank regulation and supervision ten years after the global financial crisis, Policy Research Working Paper no. 9044.
- Business and Sustainable Development Commission (2017): The state of blended finance, Working Paper.
- CBI, IISD and UK FCO (2016): Roadmap for China: green bond guidelines for the next stage of market growth.
- Climate Policy Initiative (2018): Blended finance in clean energy: experiences and opportunities.
- Climate Policy Initiative (2019): Global landscape of climate finance 2019.
- Deschryver, P. and F. De Mariz (2020): What future for the green bond market? *Journal of Risk and Financial Management*, vol. 13, no. 61,
- Ehlers and Packer (2017): Green bond finance and certification, BIS Quarterly Review, Sept. 2017.
- European Commission (2018): Report of the High-Level Expert Group on Sustainable Finance.
- EU Technical Expert Group on Sustainable Finance (2020): Taxonomy Final Report
- Flammer, C. (2020): Green bonds: effectiveness and implications for public policy, *Environmental and Energy Policy and the Economy*, vol. 1, pp. 95-128.
- Hepburn, C., B. O' Callaghan, N. Stern, J. Stiglitz and D. Zenghelis (2020): Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?
- IFC (2016): Climate Investment Opportunities in Emerging Markets.
- IFC (2019): *Global progress report of the sustainable banking network*, October.
- IFC (2020): Necessary Ambition – how low-income countries are adopting sustainable finance to address poverty, climate change and other urgent challenges.
- IIF (2020): Sustainable finance policy and alignment: the case for greater international alignment.
- IMF (2019a): The future of China's bond market.
- IMF (2019b): Fiscal policy and development: human, social, and physical investment for the SDGs, SDN no. 19/03.
- IPCC (2018): Strengthening and Implementing the global response, in: Global Warming of 1.5 degrees, IPCC Special Report
- OECD (2017): Mobilising bond markets for a low-carbon transition.
- OECD (2018): *Tracking finance flows towards assessing their consistency with climate objectives*.
- OECD (2019): Climate finance provided and mobilised by developed countries in 2013-17.
- Pauw, W., P. Castro, J. Pickering, and S. Basin (2020): Conditional nationally determined contributions in the Paris Agreement: foothold for equity or Achilles heel?, *Climate Policy*, vol. 20, no. 4, pp. 468-84.
- PRI (2018): Shifting perceptions: ESG, credit risk and ratings.
- Schmidt-Traub, G. (2015): Investment Needs to Achieve the Sustainable Development Goals — Understanding the Billions and Trillions SDSN Working Paper Version 2.
- UNEP FI (2019): Fiduciary duty in the 21<sup>st</sup> century.
- TCFD (2019): Task force on climate-related financial disclosures: status report.

Zhou, L, S. Gilbert, Y. Wang, M. Muñoz Cabré, and K. Gallagher (2018): Moving the green belt and road initiative from words to actions, World Resources Institute Working Paper.