

Stocktake of Approaches that Leverage Private Sector Investment in Sustainable Infrastructure

Disclaimer

This work is a product of the staff of the World Bank, which serves as secretariat of the Global Infrastructure Facility, a financial intermediary fund. The findings, interpretations and conclusions expressed in this work do not necessarily reflect the views of the donors, technical or advisory partners, or the governing body of the Global Infrastructure Facility, or the World Bank. The World Bank, donors, or technical or advisory partners of the Global Infrastructure Facility do not guarantee the accuracy of the data included in this work and do not assume responsibility for any errors, omissions, or discrepancies in the information, or liability with respect to the use of or failure to use the information, methods, processes, or conclusions set forth. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of the Global Infrastructure Facility or the World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions

The material in this work is subject to copyright. Because The World Bank Group encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given. All queries on rights and licenses should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; e-mail: pubrights@worldbank.org.

About the GIF

The Global Infrastructure Facility (GIF), a G20 initiative, has the overarching goals of increasing private investment in sustainable infrastructure across emerging markets and developing economies, and improving services that contribute to poverty reduction and equitable growth, aligned with the Sustainable Development Goals (SDGs). The GIF provides funding and hands-on technical support to client governments and multilateral development bank partners to build pipelines of bankable sustainable infrastructure. The GIF enables collective action among a wide range of partners—including donors, development finance institutions, country governments, private sector investors and financiers—to leverage both resources and knowledge to find solutions to sustainable infrastructure financing challenges.



STOCKTAKE OF APPROACHES THAT LEVERAGE PRIVATE SECTOR INVESTMENT IN SUSTAINABLE INFRASTRUCTURE

October 2022



Table of Contents

Abbreviations & Acronyms	1
Executive Summary: Overview	2
Four Key Action Areas	3
Introduction: The State of Sustainable Infrastructure Investments in Emerging Markets and Developing Economies	6
Scope of the Stocktake	10
Chapter 1: Evolving Policy and Enabling Environment	13
1.1 Improving National Infrastructure Plans	13
1.2 Addressing Gaps in Legal and Regulatory Frameworks for Sustainable Investments	17
1.3 Governance and Capacity Building in EMDE Countries	19
1.4 Enabling Investments by Institutional Investors	21
1.5 Promoting Standardized Sustainability Reporting	22
1.6 Fostering the Energy Transitions	24
Chapter 2: Preparing and Delivering a Pipeline of Sustainable Infrastructure Projects	26
2.1 The Current Gaps and Importance of Project Preparation in EMDEs	26
2.2 The Role of Project Preparation Facilities	27
2.3 Role of MDBs in Project Preparation	30
2.4 Project Preparation Capacity Building	32
2.5 Project Preparation for Sub-National Sustainable Infrastructure	35
2.6 Ensuring Sustainability and High Quality in Project Preparation	36
Chapter 3: Scaling-Up Private Capital Mobilization (PCM)	39
3.1 The State of PCM in Sustainable Infrastructure	39
3.2 Local Infrastructure Markets	41
3.2.1 Local banks and other market players	41
3.2.2 National Development Banks (NDBs)	42
3.2.3 Local Currency Financing	43
3.3 Blended Finance	45
3.4 Mobilization Instruments	47
3.4.1 Asset Securitization and Pooling	47
3.4.2 Asset/Capital Recycling	48
3.4.3 Investment Funds and Platforms	50
3.5 MDBs' Role	51





Chapter 4: Data, Tools, and Standards for Decision-Making and Reporting	53
4.1 Data, Tools, and Standards on Infrastructure Performance Are Critical	53
4.2 Improving Quality and Availability of Infrastructure Performance Data	54
4.3 Data and Tools for the Transition to Climate Resilient Infrastructure	56
4.3.1 Climate Mitigation: The “Net Zero” Transition	56
4.3.2 Climate Adaptation: Building Resilience	58
4.4 The Proliferation of Climate, Sustainability, and ESG Standards	59
4.5 Harmonizing Climate, Sustainability, and ESG Standards for Infrastructure	61
Appendix A: Analytical Approach	66
Appendix B: Sustainable Infrastructure Investment Databases	68
Appendix C: Examples of Frameworks, Standards and Reporting Guidance	79
Bibliography	86

Figures

ES.1: Four Key Action Areas Across the Infrastructure Lifecycle	5
I.1: PPI by Income Group, 2010–2020	9
I.2: PPI by Region, 2010–2020	9
2.1: Project Preparation Cycle	28
2.2: Scope of Project Preparation Support	29

Boxes

1.1: Examples of National Infrastructure Plans: Peru and South Africa	14
1.2: Argentina’s Private and Public Consortium to Develop Solar Photovoltaic (PV) Technology in Urban Areas (IRESUD) and Regulatory Innovation	19
1.3: Tools, Guidance, and Frameworks to Improve Infrastructure Governance and Capacity	20
1.4: Climate Disclosure and Taxonomy – Examples from the EU and China	23
2.1: Examples of MDBs’ Systemic and Standardized Approaches to Scale Infrastructure	31
2.2: Examples of Project Preparation Platforms and Infrastructure Project Databases	33
2.3: Examples of MDB- and Donor-led Climate Tools in Sustainable Project Preparation	34
2.4: Examples of Coordination among Stakeholders for Urban Sustainable Infrastructure	36
2.5: Project Preparation and Finance Highlighting Sustainability and Capacity Building	37
3.1: PCM Definition	40
3.2: NDBs Can Play a Pivotal Role in Mobilizing Local and International Capital	43
3.3: MDB On-Lending for NDBs to Make Available Local Currency	44
3.4: Examples of Blended Finance	46
3.5: Examples of Asset Securitization and Pooling	48
3.6: Examples of Asset/Capital Recycling	49
3.7: Recent Examples of Investment Platforms	51
4.1: Infrastructure Finance Data and Analytics	55
4.2: Net-Zero Reporting Initiatives for Infrastructure	57
4.3: Sustainable Infrastructure Benchmarking	64
4.4: Sustainable Infrastructure Certification and Labeling	65

Tables

1.1. Strategic Planning Principles	16
1.2: Regulatory Framework for Environmental and Social Sustainability	18
4.1: Sustainable Infrastructure Disclosure Standards	60
4.2: Overview of Current Sustainable and ESG Norms and Standards	61
A.1: List of Formal and Informal Interview Participants	66
B.1: List of Infrastructure Investment Databases	68
C.1: Compendium of Frameworks, Norms, and Standards	79



Abbreviations & Acronyms



ADB	Asian Development Bank	KPI	key performance indicator
AfDB	African Development Bank	LICs	low-income countries
AI	artificial intelligence	MDB	multilateral development bank
AiIB	Asian Infrastructure Investment Bank	MICs	middle-income countries
BRT	bus rapid transit	MIF	Multilateral Investment Fund
CAPEX	capital expenditures	MIGA	Multilateral Investment Guarantee Agency
COP	Conference of Parties	NDB	national development banks
DFI	development finance institution	NDC	Nationally Determined Contribution
EBRD	European Bank for Reconstruction & Development	NGO	non-governmental organization
EIB	European Investment Bank	O&M	operation and maintenance
EMDE	emerging markets and developing economy	ODA	official development assistance
ESG	environmental, social, and governance	OECD	Organisation for Economic Co-operation and Development
EU	European Union	OPEX	operational expenditures
FX	foreign exchange	PCM	private capital mobilization
GDP	gross domestic product	PPF	project preparation facility
GFANZ	Glasgow Financial Alliance for Net Zero	PPI	private participation in infrastructure
GHG	greenhouse gas	PPIAF	Public-Private Infrastructure Advisory Facility
GIF	Global Infrastructure Facility	PPP	public-private partnership
GIH	Global Infrastructure Hub	PPPLRC	Public-Private Partnership Legal Resource Center
IDB	Inter-American Development Bank	PSI	private sector instrument
IFC	International Finance Corporation	PV	photovoltaic
IFI	international finance institution	QII	Quality Infrastructure Investment
IMF	International Monetary Fund	SDGs	Sustainable Development Goals
IO	international organization	SME	small and medium enterprise
IPG	Infrastructure Finance, PPPs and Guarantees	SOE	state-owned enterprise
IsDB	Islamic Development Bank	TA	technical assistance
IWG	G20 Infrastructure Working Group	WBG	World Bank Group



EXECUTIVE SUMMARY

Overview

Scaling-up investments in sustainable and quality infrastructure is critical for generating long-term social, economic, and environmental benefits to societies globally.

Particularly in emerging markets and developing economies (EMDEs), sustainable and quality infrastructure serves as a necessary backbone in driving economic and social progress, as well as delivering on the ambition of the Sustainable Development Goals (SDGs) and objectives under the Paris Climate Accords. Despite broad recognition of the need for increased quality infrastructure investment, EMDEs face the reality of a growing infrastructure investment gap—one that has widened as public resources become more constrained. Indeed, EMDEs must contend with the economic and global health impacts of the COVID-19 pandemic, ramifications of the war in Ukraine and its ensuing humanitarian crisis, and intensifying damage and risks of climate change.

To withstand these challenges, build resilience against future shocks, and boost long-term sustainable and inclusive growth, accelerated private sector investment in infrastructure has never been more imperative; this not only requires efficiently leveraging limited public resources, but also, crucially, crowding-in private sector capital to fill the critical investment gap. Amplifying capital flows into sustainable infrastructure for green, resilient, and inclusive development will hinge on such collective action to meet the estimates of more than \$3 trillion in annual investments globally needed by 2050.¹

It is within this context that the Global Infrastructure Facility (GIF), under the Indonesian Presidency of the G20 and its priorities for the G20's Infrastructure Working Group (IWG), has been asked by the G20 to undertake a stocktake on leveraging the private sector's role to accelerate investment in quality, sustainable infrastructure. The stocktake considers the current landscape of initiatives and innovations across the infrastructure project life cycle to understand global trends, the perspectives of key stakeholders, and opportunities to scale-up private investment into sustainable infrastructure that builds

¹ McKinsey Global Institute. 2017, "Bridging infrastructure gaps: Has the world made progress?" McKinsey (blog), October 13, 2017, <https://www.mckinsey.com/business-functions/operations/our-insights/bridging-infrastructure-gaps-has-the-world-made-progress>.

on leading practices. Throughout the various sections, the stocktake also notes relevant innovations in tools, underlying data, and platforms that advance private capital mobilization (PCM) in sustainable infrastructure. To that end, the four chapters concern:

- Evolving upstream policy conditions to accelerate the mobilization of private capital for sustainable infrastructure investment
- Preparing and delivering robust infrastructure pipelines
- Scaling innovative financing solutions to crowd-in private capital
- Selecting standards, tools, and data for sustainable infrastructure investment and performance.

The stocktake presents an overview of recent developments in the sustainable infrastructure ecosystem, focused on providing a compendium of key resources, initiatives, and insights to facilitate understanding and application of measures to mobilize private capital for sustainable infrastructure.

In addition, it also seeks to concretely guide stakeholders—including G20 policy makers, governments, multilateral development banks/development finance institutions (MDBs/DFIs), and other key actors—to more effectively channel resources into sustainable infrastructure.

Four Key Action Areas

Whereas each chapter of the stocktake provides a series of action areas across the infrastructure value chain, four important and mutually reinforcing actions emerge as critical to scaling up private investment in sustainable infrastructure. These four key actions areas constitute concrete opportunities for G20 members, EMDE governments, the donor community, MDBs/DFIs, and other key stakeholders to develop coordinated approaches and promote collective action to enable private investment in sustainable infrastructure. These four key actions are summarized below.

1. **Build institutional capacity of, and increase support to, EMDE governments in developing and/or strengthening national infrastructure plans, policies, and regulatory frameworks centered on sustainability.**

Scaling up needed investment into sustainable infrastructure hinges on the strength of countries' enabling environments and the robustness of their respective national plans and legal frameworks. Although some EMDEs consider sustainability factors when shaping their overall infrastructure strategies and national plans, these considerations are not necessarily directly aligned with their Nationally Determined Contributions (NDCs) or the core sustainability objectives outlined in the Sustainable Development Goals (SDGs). Further, weak legal frameworks and lack of institutional capacity across EMDEs continue to hamper the ability to prepare and implement public-private partnership (PPP) projects. EMDE governments—with the support of multilateral development banks (MDBs), development finance institutions (DFIs), and other international finance institutions (IFIs)—should more explicitly link national infrastructure plans, fiscal and legal frameworks, and economic strategies to core SDG themes and the role of the private sector, to ensure that sustainable infrastructure projects are based on clear and globally agreed-upon goals. Additionally, building local institutional capacity and drumming up political will across EMDEs around the importance of robust infrastructure plans and sound fiscal and regulatory frameworks, which embed the necessary sector reforms and enable private participation in infrastructure, will be critical. Such considerations will also send a strong signal to private sector entities that are increasingly interested in aligning their

infrastructure investment decisions with environmental, social and governance (ESG) and sustainable development objectives.

2. Strengthen resources and support to infrastructure project development and preparation in order to create more robust and sustainable infrastructure project pipelines.

Among the well-documented challenges to mobilizing private capital for sustainable infrastructure at scale is the lack of well-prepared projects and investment ready opportunities. G20 members and the donor community should strengthen efforts towards project preparation, including through project preparation facilities (PPFs) at the global, national, and subnational levels. The objective should be to deploy scaled support to sustainable infrastructure programs and projects—from planning to pre-feasibility, feasibility through to transaction structuring, and the achievement of financial close—that can broadly appeal to private investors. Such support should focus on building pipelines that are high-quality, embed climate mitigation, adaptation, and resilience considerations, and fully incorporate best practices and standards, such as the Quality Infrastructure Investment (QII) Principles, at the earliest stages of project development.

3. Support scaling up catalytic financial solutions that can de-risk infrastructure and crowd-in PCM at scale.

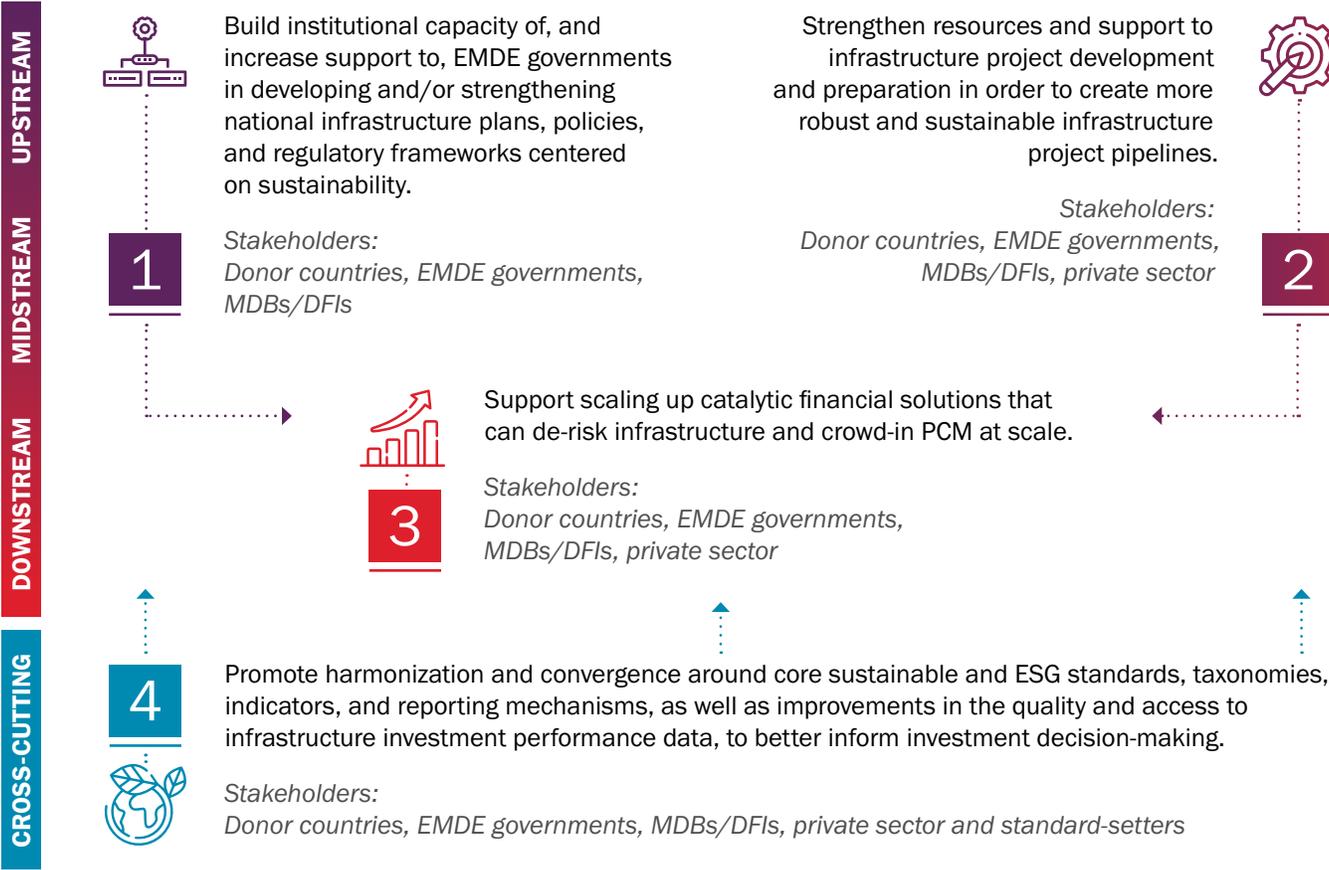
In EMDEs, the flow of private capital into sustainable infrastructure is constrained by investor perceptions of unfavorable risk-return profiles, idiosyncratic structures and uncertainty around regulatory and legal environments. The strategic use of innovative finance solutions—employing mechanisms such as blended finance solutions, asset recycling, the pooling of individual projects under a securitized program, and the use of local currency financing—can help to de-risk investment opportunities. This is especially true for projects pertaining to the low-carbon energy transition, and innovative projects in climate-sensitive and social sectors. G20 members, and the donor community, can and should play an integral role in supporting the scaling up of such mechanisms. At the same time, MDBs/DFIs can promote infrastructure financing by advisory services, developing tools and capacity building, developing local infrastructure markets, increasing the use of risk mitigation and credit enhancement products, and promoting investment tools and platforms to attract a broader array of private investors.

4. Promote harmonization and convergence around core sustainable and ESG standards, taxonomies, indicators, and reporting mechanisms, as well as improvements in the quality and access to infrastructure investment performance data, to better inform investment decision-making.

Considering the growing ecosystem—and often dizzying array—of ESG standards, frameworks, and taxonomies in the market, G20 members, MDBs/DFIs and other standard-setters should coalesce around core standards, metrics, and quantifiable methods of reporting, in order to minimize “green-washing,” promote comparability of sustainable infrastructure and ESG performance across markets and sectors, and provide clear market signals. Such collaborative efforts should build on existing initiatives already underway aimed at organizing around core standards, and be further developed to offer sector-specific guidance. Establishing consistent and comparable standards will not only inform upstream project planning, prioritization, and design, but also have an impact further downstream, in terms of investment decisions on brownfield projects. Additionally, there is an urgent need for relevant and quality data and analytical tools on infrastructure investment performance to better enable and inform investments around achievement of ESG outcomes. Particularly in EMDEs, there is a paucity

of non-proprietary, open-access data related to infrastructure assets' risks and returns; project- and portfolio-level analytics related to sector, geography, and project type; and detailed information on ESG considerations. G20 members, governments, the donor community, and MDBs/DFIs should work together to address existing data gaps in EMDEs, building on the data infrastructure and resources already in place for developed markets. Developing such granular data and analytics for EMDE infrastructure will enable investors to make more informed capital allocation decisions, and better analyze ESG data on EMDE infrastructure investment opportunities.

FIGURE ES.1: FOUR KEY ACTION AREAS ACROSS THE INFRASTRUCTURE LIFECYCLE





INTRODUCTION

The State of Sustainable Infrastructure Investments in Emerging Markets and Developing Economies

Sustainable, quality infrastructure serves as a key driver of economic and social development, as well as long-term environmental sustainability. However, investment in such infrastructure is chronically well below the required levels, particularly in EMDEs. Recently, the problem has been exacerbated by the disruption to infrastructure investment caused by the COVID-19 pandemic. Although markets around the world are now beginning to look beyond the peak of the pandemic, the ripple effects of COVID-19 have been compounded, globally, by alarming economic decline, supply chain disruptions, and the ongoing war in Ukraine. According to the International Monetary Fund (IMF), the economic impacts from the conflict will contribute to stagnated global growth, increased inflation, and rising and volatile energy prices, hitting vulnerable populations and EMDEs the hardest.² Against this backdrop, there is a growing need to rapidly increase availability and financing for resilient, inclusive, and sustainable infrastructure globally—an important basis for the post-pandemic economic recovery, reconstruction efforts in Ukraine, and achievement of the 2030 Agenda for SDGs and the goals of the Paris Climate Accords.

EMDEs face significant infrastructure needs if they are to deliver on global development goals. Even prior to the pandemic, the World Bank estimated the relevant infrastructure investment needs for EMDEs represent on average 4.5 percent of their aggregated annual gross domestic product (GDP) levels—mainly for energy and transport, but,

² IMF, World Economic Outlook Update, 'Gloomy and More Uncertain' July 2022, <https://www.imf.org/en/Publications/WEO/Issues/2022/07/26/world-economic-outlook-update-july-2022>

critically, also for investments in infrastructure that increase adaptive capacities in areas such as water, flood protection and irrigation.³

With an estimate of more than \$3.3 trillion of annual investments globally needed to meet the SDGs and Paris Agreement goals, it may all seem rather daunting. The significant infrastructure investment gap precedes the pandemic, with studies from the GIH, the United Nations, and McKinsey estimating annual investment gaps hovering between \$2.5 trillion to \$3 trillion globally.^{4,5,6} Governments have traditionally remained the largest funders of infrastructure through budgetary allocations, generating revenue for infrastructure costs through taxes, tariffs, and other user charges. Yet in EMDEs, establishing predictable, long-term revenue streams to repay significant funding costs is challenging. And although MDBs/DFIs have played a substantial role in filling gaps, their direct financing—even when stretched to its limits—is unlikely to fill the anticipated needs. Indeed, public budgets, already strained by the COVID-19 pandemic, cannot begin to cover these needs.

Private funds and investors will need to step in to fill that critical investment gap.

Prior to the pandemic, the Asian Development Bank (ADB) estimated an annual infrastructure gap of \$204 billion to be filled through private sector investment—an amount that is now expected to increase.⁷ Beyond addressing the considerable investment gap in EMDEs, the private sector can bring comparatively higher efficiency advantages in certain sectors and markets where the public sector would face higher costs of capital if it were to raise public funds for infrastructure. In such contexts, the private sector brings more than just additional finance; it provides efficiency gains that yield higher returns and offset the higher cost of capital and opportunity cost had public or concessional finance been leveraged.⁸

Yet, simply increasing investment and capital expenditures in infrastructure is not enough.

Improving quality and enhancing operations and maintenance (O&M)—that is, not just investing *more*, but investing *better*—is equally important and can generate significant savings over the asset life cycle. In the transport and water sanitation infrastructure sectors, resources channeled towards ensuring good maintenance provision of assets resulted in reduced life cycle costs of more than 50 percent.⁹ These considerations on the importance of infrastructure maintenance have also been reiterated by the G20 QII Principles and recent related OECD and World Bank studies (e.g., the OECD's *New Strategies for Strengthening Infrastructure Resilience and Maintenance* and the World Bank's *Well-maintained: Economic Benefits from More Reliable & Resilient Infrastructure*).

Nonetheless, significant economic barriers and challenges exist to mobilizing private investment in infrastructure at scale. Rising public debt levels, currency fluctuations, tightened external financing

3 “Rozenberg, Julie, and; Marianne Fay, Marianne. 2019. *Beyond the Gap : How Countries Can Afford the Infrastructure They Need while Protecting the Planet*. Sustainable Infrastructure. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/31291>.

4 UN, *Financing the 2030 Agenda*, January 2018, <https://www.undp.org/publications/financing-2030-agenda>

5 GIH (Global Infrastructure Hub). 2022. “Global Infrastructure Outlook.” https://outlook.gihub.org/?utm_source=GIHub+Homepage&utm_medium=Project+tile&utm_campaign=Outlook+GIHub+Tile

6 McKinsey Global Institute. 2017, “Bridging infrastructure gaps: Has the world made progress?” McKinsey (blog), October 13, 2017, <https://www.mckinsey.com/business-functions/operations/our-insights/bridging-infrastructure-gaps-has-the-world-made-progress>.

7 PPIAF (Public-Private Infrastructure Advisory Facility) and , World Bank Group. 2022., *COVID-19 and Public-Private Partnerships Practice: Assessing the Impact of COVID-19 on PPP Pipelines and Projects in Preparation*, 2022.

8 Cordella, Tito. 2018. *Optimizing Finance for Development.*, Washington, DC: World Bank Group, January 2018., https://library.pppknowledgelab.org/covid_response_practice_notes/COVID-19_and_PPP_Practice_Note_2_-_Projects_in_preparation_and_pipelines.pdf.

9 Julie Rozenberg, Marianne Fay, *Beyond the Gap: How Countries Can Afford the Infrastructure They Need While Protecting the Planet*, World Bank Group, 2019, <https://openknowledge.worldbank.org/handle/10986/31291>

conditions, and weakened growth trajectories in EMDEs are only some of the challenges facing such markets—challenges that existed before the pandemic. And in general, private capital is reluctant to invest at the required scale in large infrastructure projects given the challenges in accurately budgeting development costs and timelines, as well as in forecasting expected revenue streams in the absence of an operating history.¹⁰ Moreover, depending on country and sector conditions in EMDEs, increased sovereign and regulatory risks raise the cost of commercial financing, and securing the investment-grade rating necessary for institutional investors to invest may be particularly challenging. Further, options to mitigate regulatory, currency, sector/project, and political risk—particularly in unstable enabling environments—increase the cost and risk of the private sector to invest in needed infrastructure.¹¹

In the face of these obstacles, private investment in EMDE infrastructure has significantly declined.

The downward trajectory of investments in EMDEs was declining prior to the COVID-19 pandemic. This downward trend worsened during the pandemic as a result of delays, cancellations, and changes to PPP projects. This resulted in an overall decline in private participation in infrastructure (PPI), with PPI investment in EMDEs shrinking to \$45 billion in 2020, its lowest level since 2004, according to a World Bank Group study.¹² Further, *Infrastructure Monitor 2021* notes that global private investment in infrastructure in primary markets in 2020 was \$156 billion—this represents .2 percent of total global GDP, short of the 5 percent of GDP (combining public and private investment) that many studies indicate as required to close the infrastructure gap, as shown below in Figure I.1. As seen in Figure I.2, the decline in private investment in infrastructure projects in some regions was significantly offset by increases in others, with higher income regions accounting for around 60 percent of investment.¹³

In 2021, EMDE PPI commitments increased by 49 percent, showing clear signs of recovery, although commitments were still 12 percent lower than the previous five-year average (2016–2020).¹⁴

Although this may suggest that recovery is underway, tight fiscal and financing conditions will require selectivity and attention to investments that advance quality and sustainable infrastructure and support multiple economic and social goals. As economic stimulus slows, credit conditions tighten, and uncertainty from overlapping crises intensifies, there will be an even greater need for reforms and for scaling up private investment in sustainable infrastructure.

Scaling up needed private investment in sustainable infrastructure will require working collectively to enable private sector solutions and putting in place stronger foundations for recovery.

Now more than ever, catalyzing capital flows into sustainable infrastructure for green, resilient, and inclusive development will be critical for driving economic growth. At the same time, rapidly growing demand from asset owners, regulators, and the public for finance and investments that advance sustainable growth is intersecting with intense pressure to deliver quality infrastructure that can withstand the impacts of climate change.

10 Abadie, Richard. 2021. Abadie, “Global infrastructure trends: Developments in financing.” PwC, 2021., <https://www.pwc.com/gx/en/industries/capital-projects-infrastructure/publications/infrastructure-trends/global-infrastructure-trends-financing.html>.

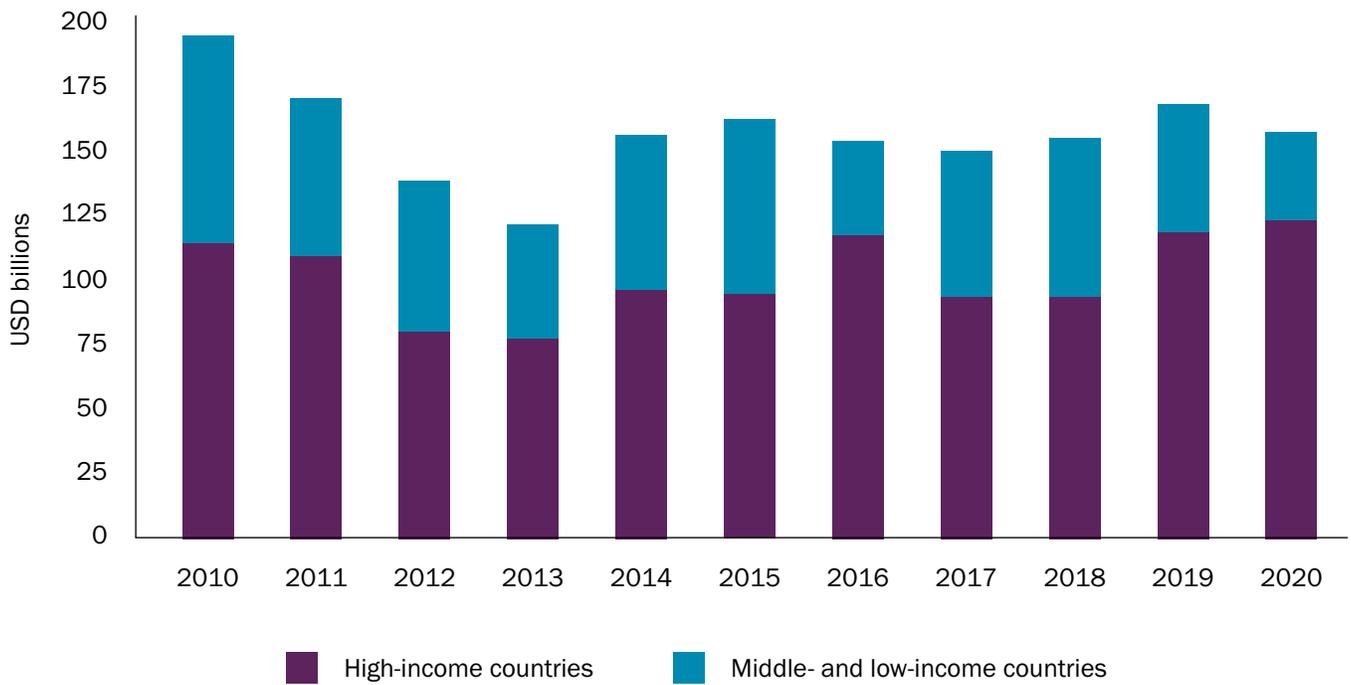
11 OECD (Organisation of Economic Co-operation and Development) and , World Bank Group. 2015., *Risk and Return Characteristics of Infrastructure Investment in Low Income Countries*, September 2015. . Paris: OECD. <https://www.oecd.org/g20/topics/development/Report-on-Risk-and-Return-Characteristics-of-Infrastructure-Investment-in-Low-Income-Countries.pdf>.

12 World Bank Group, PPIAF. *Assessing the Impacts of COVID-19 on PPP Pipelines and Projects in Preparation*. 2021. https://library.pppknowledgehub.org/covid_response_practice_notes/COVID-19_and_PPP_Practice_Note_2_-_Projects_in_preparation_and_pipelines.pdf

13 GIH (Global Infrastructure Hub). 2020. *Infrastructure Monitor (2021)*. GIH. https://www.gihub.org/infrastructure-monitor/?utm_source=peremail&utm_medium=email&utm_campaign=IM-launch.

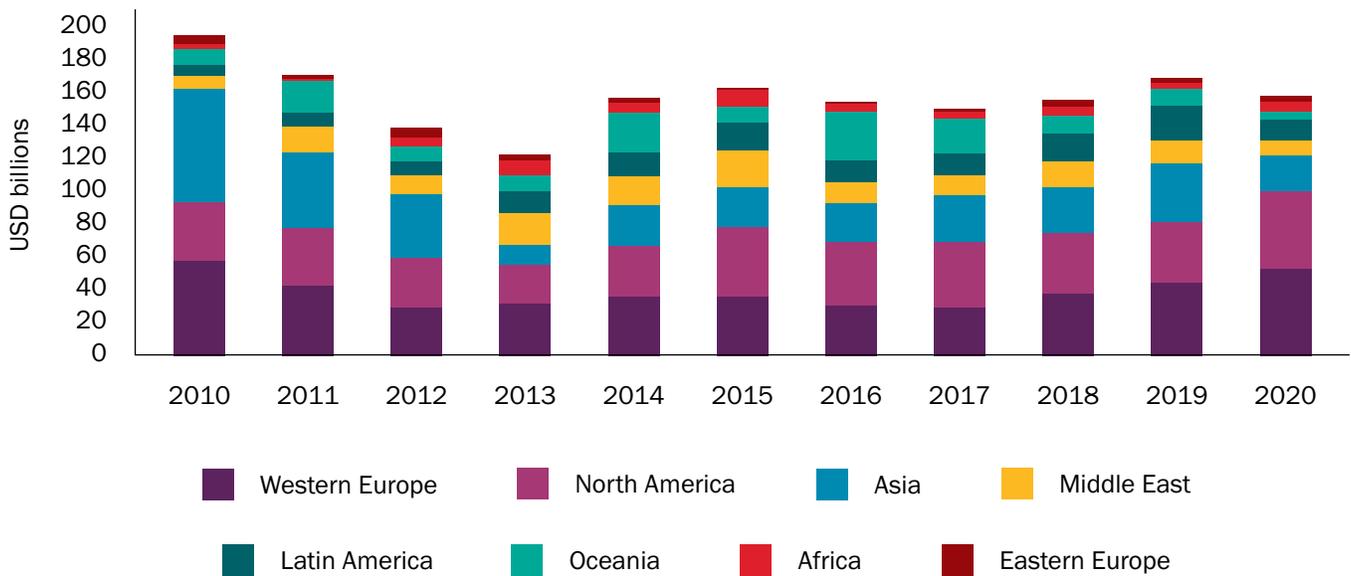
14 World Bank, *Private Participation in Infrastructure Annual Report*, 2021

FIGURE I.1: PPI BY INCOME GROUP, 2010–2020



Source: GIH 2021.

FIGURE I.2: PPI BY REGION, 2010–2020



Source: GIH 2021.

Scope of the Stocktake

The stocktake assumes foundational knowledge and understanding of infrastructure PPPs and the varied sources of finance that can be leveraged to support infrastructure development in advancement of the SDGs and Paris Agreement. Given the breadth of this field, it is important to note that the stocktake is not meant to encompass all topics, markets, and sectors in the sustainable infrastructure ecosystem. Rather, the stocktake should be read as an inexhaustive compendium of core global initiatives and insights surfaced from stakeholder consultations to enable G20 policy makers, EMDE governments, MDBs/DFIs, the private sector, and other key actors to better identify, utilize, and understand the tools that are essential for increasing private financing for sustainable infrastructure in EMDEs in particular—broadly, low-income countries (LICs) and middle-income countries (MICs).

To that end, the stocktake builds on the G20's efforts over the past decade to grow “infrastructure as an asset class,” and fill the gap in finance for quality, sustainable infrastructure. Although it is understood that infrastructure investments have traditionally been financed through public funds, with governments serving as the main actor in this field, budgetary pressures and limited fiscal space have given rise to PPPs and alternative sources of financing, to support infrastructure development—including from the private sector.¹⁵ Building on previous initiatives, the World Bank Group's (WBG) and development partners' approach to PCM appreciates that the size of investment needed to achieve the SDGs necessitates broadening the sources of financing and increasing the mobilization of private capital in addition to domestic revenue—including deploying a mix of financing and guarantee instruments, investment platforms, short-term financing initiatives, and PPP transaction advisory support.¹⁶

For the purposes of the stocktake, the scope focuses specifically on scaling up sustainable infrastructure through the mobilization of private capital as analyzed primarily through private participation in PPPs and concessions, as well as through governments or state-owned enterprises raising long-term private finance through banking or capital markets. The stocktake also considers and references a range of tools and initiatives that have helped governments make more informed decisions about improving the quality of infrastructure services to mobilize private capital.¹⁷

Further, the stocktake targets initiatives focused exclusively on efforts to mobilize private capital for “sustainable” infrastructure (defined below), recognizing the growth of sustainable finance, environment, social and governance (ESG) integration, blended finance, impact investments, and their influence on infrastructure investment. The report illustrates varied and increasingly pervasive efforts across the infrastructure life cycle to bring in more sustainability-driven private capital.

15 The World Bank Group's (WBG) approach to PCM builds on the group's Maximizing Finance for Development (MFD) approach developed in 2017. MFD employs a process called the “Cascade,” which seeks to maximize the impact of scarce public resources by prioritizing the mobilization of commercial finance while remaining affordable and offering value for money. Where commercial financing is not cost effective, support will then be directed towards addressing those market failures (e.g., through sector and regulatory reform). Where market solutions are not possible through reform and risk mitigation, priority will then be applied to concessional and official/public resources.

16 WBG (World Bank Group). 2020., *World Bank Group Approaches to Mobilize Private Capital for Development: An Independent Evaluation*, 2020., Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/35040>.

17 The World Bank's Public-Private Partnership Legal Resource Center (PPPLRC) PPP Knowledge Lab has produced a series of resources for understanding the PPP project life cycle, including a compendium of tools and programs, specifying at which PPP stage to use each tool as highlighted in *Private Partnerships in Infrastructure: Toolkit*. <https://thedocs.worldbank.org/en/doc/982261479317855835-0100022016/original/InfrastructureToolkitBookletFINALWEB.pdf>.

As a definition for sustainable infrastructure, the stocktake focuses on:

- Infrastructure that enables economic and social development, and environmental sustainability, as well as climate resilience
- Infrastructure that enhances productivity and competitiveness while contributing to economic growth, employment, and international trade and connectivity
- Infrastructure that promotes social inclusion, equity, and human capital formation.

The concept of sustainable infrastructure is underpinned by good policy, sound planning, efficient procurement, smart regulation, transparent governance, affordable finance, and functional markets.

The stocktake uses the following terms, aiming for precision, simplicity, and consistency:

Sustainability and the adjective, **sustainable**, are used as an umbrella concept to represent broad-based goals and outcomes resulting from initiatives such as the SDGs or other comprehensive approaches to balance the current and future needs of society, economies, and the natural world. Sustainability themes, as they relate to infrastructure that are broadly covered in this stocktake, include, but are not limited to: economic, fiscal, and social impacts; climate change; gender equality and inclusion; InfraTech; biodiversity; nature-based solutions; and urbanization.

ESG describes systematic, often data-driven and measurable approaches to considering environmental, social, and governance (ESG) factors as part of business, financing, or investment decision-making and associated risks and returns. The abbreviation can be used to characterize analysis, frameworks, policies, scores, or other inputs that embrace all three dimensions to manage both risks and opportunities to achieve sustainability outcomes.

Climate action refers to stepped-up efforts that aim to: reduce greenhouse gas emissions (climate mitigation), strengthen systems' ability to respond to and recover from climate impacts such as extreme weather (climate resilience), and improve adaptive capacity to existing and expected climate-induced impacts (climate adaptation).

The stocktake analyzes the current state of play for private sector participation for sustainable infrastructure development, with a focus on both greenfield and brownfield investments most needed in EMDEs. It considers the roles of the major market participants, including governments, MDBs/DFIs, private and financial sector institutions and capital.

The stocktake report is organized as follows:

- Chapter 1 reviews upstream public policy actions to scale up private sector participation in sustainable infrastructure, examining frameworks, planning, governance, and environmental, social and financial policy considerations that drive infrastructure. Although governments have been making substantial efforts in such areas, this chapter will primarily focus on recent initiatives and upstream action areas.

- Chapter 2 looks at the current gaps and importance of preparing and delivering bankable, sustainable infrastructure project pipelines as one of the key preconditions for crowding-in private capital.
- Chapter 3 moves downstream to focus on approaches in scaling up private mobilization of sustainable infrastructure finance, including blended financing, pooling and securitization, local currency financing, asset recycling, and role of local financial institutions and MDBs.
- Chapter 4 examines the proliferation of norms, standards, and data, focusing particularly on ESG frameworks and infrastructure performance, as well as tools to better inform investment decision-making in sustainable infrastructure.

The stocktake report aims to provide action areas for G20 policy makers, EMDE governments, MDBs/DFIs, the private sector, and other key stakeholders to support decision-making in sustainable infrastructure development at every stage of the project life cycle. The stocktake identifies trends and gaps, successful replicable and scalable initiatives, best practices and lessons learned. In addition, the report highlights the importance of collaboration among public-private stakeholders at various levels, to create transformational change in private investment in sustainable infrastructure.





CHAPTER 1

Evolving Policy and Enabling Environment

1.1 Improving National Infrastructure Plans

National plans, which include infrastructure sector plans, are a way for governments to send signals to the market of their commitment to sustainable infrastructure investment. Although donors and EMDE governments have been working on various policy-related and enabling environment binding constraints for years, political buy-in and long-term plans are critical to creating conditions suitable for private investment in infrastructure. Although there is a broad range of policies and reforms to consider within the upstream space, this section examines issues specific to scaling sustainable infrastructure investments and the mobilization of private capital in recent years.

In varied surveys, planning at all levels has improved slowly in EMDEs. Infrastructure transition pathways to achieve global climate targets and SDGs have also recently gained increased attention by G20 member countries and other key stakeholders. Though more countries now explicitly address the SDGs and climate resilience in their national public investment planning and infrastructure strategies, they often do not explicitly publish their plans and pipelines. This information may be embedded in economy-wide development or competitiveness plans, making it less discoverable, accessible, and usable by both public and private decision-makers. Some countries, however, have become more systematic and transparent in making infrastructure plans that identify and prioritize project pipelines and infrastructure decarbonization goals publicly available.

Evidence from EMDE countries, which have witnessed increased private sector investments in sustainable infrastructure, suggests that private sector actors are attracted to markets where national leadership can muster vision, political will, and planning to advance multiyear investment programs that clearly define the private sector's role.

With the pressing need to “invest better” rather than “invest more,” transparent national infrastructure plans (discussed in Box 1.1) send clear signals about sustainable infrastructure goals and are characterized by:

- Assessing infrastructure gaps, potential solutions and broad benefits with wide consultation
- Aligning with NDCs to achieve Paris Agreement goals, and with national SDG targets
- Quantifying gaps by sector in a rigorous manner, estimating for climate uncertainty, and quality improvements and resilience in line with a medium-term fiscal framework
- Detailing sectoral decarbonization pathways, whole-of-government institutional coordination and major program and project priorities
- Clarifying the fiscal measures, regulation, financing plans and incentives needed to achieve low-carbon private sector and industrial development via infrastructure investments.

BOX 1.1: EXAMPLES OF NATIONAL INFRASTRUCTURE PLANS: PERU AND SOUTH AFRICA¹⁸

Peru's National Infrastructure Plan for Competitiveness (PNIC) launched in 2019 with a vision extending to 2038. It quantifies each sector's infrastructure gap, emphasizing transportation, sanitation and health investments. The planning process was recognized for systematic efforts to quantify gaps, especially to address the poor quality of social infrastructure; an emphasis on resilience to climate risks; and its embrace of innovation, sustainability, technology and international best practices.¹⁹ It outlines financing mechanisms beyond concessions and PPPs, such as works-for-taxes and government-to-government (G2G) contracts. The government has also promoted the plan in English with global consulting firm EY as part of its investment promotion strategy²⁰.

South Africa's National Infrastructure Plan 2050 links top development objectives to actions that improve infrastructure delivery in the short term. It also identifies institutional bottlenecks and medium-term outcomes. The plan emphasizes building capacity in knowledge and innovation services, public-private cooperation, blended and innovative finance and other interventions for improved delivery, quality and sustainability.

Sources: Peru and South African Governments' Infrastructure Plans.

18 Respectively, these resources can be found at: *South Africa's National Infrastructure Plan 2050, 2022*, https://www.gov.za/sites/default/files/gcis_document/202203/46033gon1874.pdf; Government of Peru, *Plan Nacional de Infraestructura para la Competitividad, 2019* https://www.mef.gob.pe/contenidos/inv_privada/planes/PNIC_2019.pdf; Patricia De Lille, Government of South Africa Notices, “Goewermentskennisgewings: National Infrastructure Plan 2050 (NIP 2050),” February 2022, . https://www.gov.za/sites/default/files/gcis_document/202203/46033gon1874.pdf.

19 Zuñiga, Mariana Silva, Wilhelm Dalaison, and Cristina Calderón. 2019. “Three Good Practices of Peru's National Infrastructure Plan for Sustainable Economic Growth.” IDB (Inter-American Development Bank) blog post, August 15, 2019. <https://blogs.iadb.org/sostenibilidad/en/three-good-practices-of-perus-national-infrastructure-plan-for-sustainable-economic-growth/>

20 ProInversión, Government of Peru Ministry of Foreign Affairs, and EY. 2020. Peru's Infrastructure Investment Guide 2020/2021. https://assets.ey.com/content/dam/ey-sites/ey-com/es_pe/topics/infrastructure/ey-perus-infrastructure-investment-guide.pdf?download

Yet national infrastructure plans in EMDEs with clear sustainability goals are rare. The Organisation for Economic Co-operation and Development's (OECD) *Recommendation on the Governance of Infrastructure (2020)*^{21, 22} found that infrastructure planning varied widely among member countries across key criteria:

- Only 38 percent of countries had adopted both overall and sectoral infrastructure plans, with another third adopting only sector plans
- About one-fifth of member countries had developed plans with time horizons of less than 10 years
- Only about half have land use, spatial planning and regional development plans. Social goals are included less often: 31 percent address gender and inclusion, and 19 percent address human rights
- More than half coordinate across government and sectors, yet only 22 percent coordinate across borders
- 75 percent have environmental or climate action plans
- Almost 60 percent have national documents articulating a long-term vision and strategic plan.

The InfraCompass 2020 concurs that planning is the least improved driver since InfraCompass 2017, with 38 percent of countries not publishing infrastructure plans and 28 percent not publishing project pipelines. Sub-national governments often fill this gap with their own infrastructure plans.

Guidance and tools have been developed to support sustainable infrastructure planning to achieve country-level NDCs and the SDGs. For example:

- The **IMF's Climate-Public Investment Management Assessment (C-PIMA)** evaluates “climate-focused national planning, coordination within the public sector, appraisal and selection, budget and portfolio management and risk management” to advise on readiness and needed reforms to develop sustainable infrastructure.²³
- The **OECD Recommendation on Governance of Infrastructure** provides good practices and tools to bridge long-term infrastructure planning with “multi-disciplinary objectives, such as climate resilience, social inclusion, sustainable growth and gender equality policy,” and also advocates the embrace of technology and data for infrastructure.²⁴
- The recently launched **World Bank Country Climate Development Reports (CCDRs)** integrate climate action and development goals into a diagnostic that identifies low-carbon infrastructure development pathways and their costs, potential public investments and means of mobilizing public and private finance.²⁵
- The World Bank's **Infrastructure Sector Assessment Program (InfraSAP)**, a strategic planning tool that helps governments identify opportunities for improving infrastructure performance among different sectors.²⁶

21 OECD, “Long-term strategic planning,” 2020, <https://www.oecd.org/gov/infrastructure-governance/strategic-planning/>

22 OECD (Organisation for Economic Co-operation and Development). 2020. , “Infrastructure Governance – Long Term Strategic Planning.” 2020, OECD. <https://www.oecd.org/gov/infrastructure-governance/strategic-planning/>.

23 IMF (International Monetary Fund). 2021. , “Strengthening Infrastructure Governance for Climate-Responsive Public Investment.”, IMF Policy Paper, December 22, 2021., <https://www.imf.org/en/Publications/Policy-Papers/Issues/2021/12/22/Strengthening-Infrastructure-Governance-for-Climate-Responsive-Public-Investment-511258>.

24 OECD (Organisation for Economic Co-operation and Development). 2020. , “Recommendation of the Council on the Governance of Infrastructure.”, OECD (legal instruments), July 16, 2020, <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0460#mainText>.

25 World Bank. 2022. , “World Bank Group Launches First Country Climate and Development Report.”, World Bank Press Release (press release), June 16, 2022., <https://www.worldbank.org/en/news/press-release/2022/06/16/world-bank-group-launches-first-country-climate-development-report>.

26 World Bank. 2019. “Infrastructure Strategy,” <https://www.worldbank.org/en/topic/infrastructure/overview#2>

Planning frameworks for sustainable infrastructure developed in recent years by MDBs, donors, the OECD, the UN system, NGOs, and others address multiple dimensions and the need for coordinated sub-national processes. Common principles are outlined in Table 1.1.

TABLE 1.1: STRATEGIC PLANNING PRINCIPLES²⁷

Framework principle	Description
Country leadership	Sustainable development policy owned by governments, linked to country strategies, global climate commitments and sustainability goals, and aligned with global standards and taxonomies
Systems perspective	Integration of global, national, regional, and local perspectives on COVID-19, climate change, social inclusion, and sustainable development
Optimizing efficiencies	Long-term, quality-maximizing and risk- and cost-minimizing approaches, upstream, and across sectors with social, economic, and environmental outcomes ²⁸
Robust decision-making	Transparent, multidisciplinary, data-driven and across-time horizons with diverse perspectives integrated as early as possible
ESG integration	Social and environmental considerations in economic and social infrastructure, especially in project prioritization, to filter projects ex ante based on risks
Value-for-money	Extending value-for-money analysis to include impacts on communities, especially low income and marginalized service users
Life-cycle sustainability	Up-front capital investment offset by lower risk in project development, lower O&M costs, and longer asset lives
Technology as enabler	Benefits from efficiency and resilience, environmental and social performance data, and opportunities for private sector development and industrial growth ²⁹

ACTION AREA 1.1

Improve and prioritize EMDEs’ strategic planning for low-carbon, resilient infrastructure investment at the national and sub-national levels, and make plans more transparent to clearly signal priorities to policy makers, implementing agencies and market participants.

27 OECD, "OECD Compendium of Policy Good Practices for Quality Infrastructure," November 2, 2020, <https://www.oecd.org/finance/oecd-compendium-of-policy-good-practices-for-quality-infrastructure-investment.htm>; OECD, "Strategic Policies for Sustainable Infrastructure Initiative," accessed 6 July 2022;
 Amar Bhattacharya, Beatriz Nofal, Linda Krueger, Minji Jeong, and Kevin Gallagher, "Policy and Institutional Framework for Delivering on Sustainable Infrastructure," G20-Insights, May 2019, <https://www.g20-insights.org/wp-content/uploads/2019/05/t20-japan-tf4-10-policy-institutional-framework-delivering-sustainable-infrastructure.pdf>; UNEP, "International Good Practice Principles for Sustainable Infrastructure," United Nations Environment Programme (UNEP) Publications, Feb 2021, ISBN No: 978-92-807-3928-2, <https://www.unep.org/resources/publication/international-good-practice-principles-sustainable-infrastructure>;
 United Nations Economic Commission for Europe (UNECE), "Guiding Principles on People-First Public-Private Partnerships (PPPs) for the United Nations Sustainable Development Goals (UN SDGs): Part II-The 8 Guiding Principles for People-First PPPs in Support of the UN SDGs," May 3, 2018, https://unece.org/fileadmin/DAM/ceci/documents/2018/PPP/Forum/Documents/The_8_Guiding_Principles_for_People-first_PPPs_in_support_of_the_UN_SDGs-Part_II.pdf.

28 Bhattacharya et al. 2019.

29 World Bank 2020.

1.2 Addressing Gaps in Legal and Regulatory Frameworks for Sustainable Investments

It is well-known that legal and regulatory risks are among the major binding constraints for mobilizing private capital. In the context of sustainable infrastructure investment, the most cited issues raised during stocktake interviews were:

- Contractual enforcement (e.g., dispute resolution, renegotiation of concession agreements)
- Efficient, predictable, transparent regulatory behavior (e.g., streamlined permitting, renewable energy auctions)
- Management of vested interests and competition (e.g., incumbent utilities, fossil fuel producers, sector/state-owned enterprise [SOE] reforms)
- Reforms to established practices (e.g., emphasis on least cost, unclear consideration of quality)
- Cost recovery of low-carbon investments (e.g., tariff adjustments)
- Capacity to innovate and engage in market transformation (e.g., transmission unbundling and grid investments).

The above issues notwithstanding, there are signs that better infrastructure regulation is promoting market growth, efficiency, and the mobilization of private capital for sustainable infrastructure. The InfraCompass 2020 report points to strengths, opportunities and challenges that correspond to country income level. Upper and lower-middle-income countries benefit from lower costs and less time to start businesses and acquire land, as well as improved insolvency frameworks and project and procurement transparency. LICs have improved land registration and economic and environmental assessments, but need to improve transparency, and insolvency and dispute resolution frameworks.³⁰

Donor governments, MDBs/DFIs, and IOs have especially focused on supporting EMDE governments in integrating climate issues into PPPs and achieving their NDCs more broadly. Recent examples include:

- The World Bank's PPP Legal Resource Center's extensive resources in the **Climate-Smart PPP Legal and Regulatory Framework**, which includes international examples and databases of climate change laws³¹
- The recently launched **World Bank Climate Toolkits for Infrastructure PPPs (CTIP3)**, which places domestic policy in an international context, assesses domestic climate change related laws and policies, and reviews institutional capacity³²
- The **US Commercial Law Development Program's training content** on energy transition for ministries, regulators and SOEs to adopt policies to phase down high-emitting energy infrastructure, lower carbon emissions in existing facilities, reform power markets, build carbon markets and attract climate finance³³

30 GIH (Global Infrastructure Hub). 2020., InfraCompass. GIH. 2020, <https://content.gihub.org/live/media/2114/infracompass-2020-report-web-optimised.pdf>

31 World Bank, "Climate-Smart PPP Legal and Regulatory Framework," (Washington DC: World Bank 2022), <https://ppp.worldbank.org/public-private-partnership/climate-smart/climate-smart-clean-technology-ppps/climate-smart-ppp-legal-and-regulatory-framework>.

32 World Bank, IFC (International Finance Corporation (IFC), and MIGA (Multilateral Investment Guarantee Agency (MIGA). 2022., "Climate Toolkits for Infrastructure PPPs, Climate Toolkits for Infrastructure PPPs," (Washington DC: World Bank, 2022), World Bank. <https://openknowledge.worldbank.org/handle/10986/37287>.

33 "Energy Transition," training content, US Commercial Law Development Program, accessed 6 July 2022, <https://cldp.doc.gov/areas-expertise/energy-transition>

The World Bank's RISE reveal that over the past decade, 99 percent of countries have established a comprehensive legal framework for renewable energy or had begun to do so by 2019.³⁴ In the utility scale renewable energy sector, countries that have successfully implemented and managed reforms and witnessed thriving public-private ecosystems include Colombia, India and South Africa. Certain common features of regulatory frameworks that include climate change and environmental and social sustainability are summarized in Table 1.2.

TABLE 1.2: REGULATORY FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL SUSTAINABILITY

Economic sustainability	Climate, environmental and social sustainability
Structural reforms to promote competition and diminish SOE/monopoly dominance	Reforms to allow new entrants and fill regulatory gaps for low-carbon technologies
Adoption of OECD/international policy and standards to lower country risk perception and to instill trust	Adoption of sustainable infrastructure standards, development of technical standards
Rule of law and enforcement, better quality contracts, conflict resolution mechanisms ³⁵	Contracts detailing parties' environmental and social responsibilities over time
Transparency and meaningful disclosures for investors	Disclosures on ESG issues and impacts
Ex post resolution of land use/acquisition disputes	Planning with communities, nature-based solutions
Tax incentives and measures to improve cost recovery	Ending fossil fuels subsidies, carbon pricing

With private interest in sustainable infrastructure, regulatory innovation has become even more crucial to meet this demand (Box 1.2). Dialogue with regulators is needed to establish new, low-carbon businesses and to avoid the deterrent effect of unclear future regulatory action. Regulatory innovation sandboxes and pilots are emerging to facilitate policy experimentation with the private sector.³⁶

34 ESMAP (Energy Sector Management Assistance Program (ESMAP). 2020., *Regulatory Indicators for Sustainable Energy (RISE): Sustaining the Momentum.*, (Washington, DC: World Bank.), 2020, <https://rise.esmap.org/data/files/reports/rise-renewableenergy.pdf>.

35 One interviewee noted that contract enforcement was suffering because of the Ukraine war and geopolitical tensions and that conflicts sometimes generate opportunism with respect to adherence to contract terms.

36 Cristina Rosemberg et, Xavier Potau, Samuel Leistner, Felix Dijkstal, Aaron Vinnik, Costanza Tiriduzzi, Anoushka Daved, and Knut Blind, "Regulatory Sandboxes and Innovation Testbeds: A Look at International Experience in Latin America and the Caribbean," (Washington DC: Inter-American Development Bank (IDB), 2020), <https://publications.iadb.org/publications/english/document/Regulatory-Sandboxes-and-Innovation-Testbeds-A-Look-at-International-Experience-in-Latin-America-and-the-Caribbean.pdf>.

BOX 1.2: ARGENTINA'S PRIVATE AND PUBLIC CONSORTIUM TO DEVELOP SOLAR PHOTOVOLTAIC (PV) TECHNOLOGY IN URBAN AREAS (IRESUD) AND REGULATORY INNOVATION

Argentina's IRESUD is an innovation test bed structured as a public-private partnership, collaborating with the government's national electricity regulator and the Ministry of Energy. Its goal is to develop laws, regulations and economic instruments to develop on-grid distributed solar PV generation. IRESUD benefits from the oversight and engagement of government regulators, the research capabilities of the National University of San Martin, and the private sector perspective offered by five participating companies. IRESUD could test PV systems to consider standards and design while the private partners and university could support design, operation and installation. As a result, Argentina developed standards and regulations for distributed solar.

Source: *Inter-American Development Bank.*

ACTION AREA 1.2

Accelerate the development of stable, transparent, and sector-specific legal and regulatory frameworks across infrastructure sectors through technical assistance and policy reform support for sustainable infrastructure investment.

1.3 Governance and Capacity Building in EMDE Countries

Research and interviews identified a number of governance concerns constraining sustainable infrastructure investment in EMDE countries, including weak leadership, lack of consistency, poor intragovernmental coordination, and non-transparent and non-competitive processes. Infrastructure governance as a concept has gained increased support in recent years, and has already been reflected in the QII Principles. The compendium of G20 QII Principles provides a menu of voluntary, non-binding, non-prescriptive and customizable principles that stakeholders can tailor to their individual needs and can, where appropriate, help inform decision-making on the design, building, operation, and maintenance of infrastructure assets.³⁷ Likewise, the OECD's *Getting Infrastructure Right: A Framework for Better Governance* report surveys 27 countries and provides an overview of current practices in infrastructure governance, presenting practical tools to help policy makers better manage infrastructure.³⁸

37 Japanese G20 Presidency 2019, "G20 Principles for Quality Infrastructure Investment," 2019, https://www.mof.go.jp/english/policy/international_policy/convention/g20/annex6_1.pdf

38 OECD, *Getting Infrastructure Right: A Framework for Better Governance*, March 20, 2017, <https://www.oecd.org/publications/getting-infrastructure-right-9789264272453-en.htm>

Although there have been considerable efforts initiated by the donor, IO, and MDB/DFI communities to promote various capacity-building initiatives, tools, and infrastructure governance frameworks as highlighted in Box 1.3, such tools are only as effective as they are utilized, an area that needs further examination.

BOX 1.3: TOOLS, GUIDANCE, AND FRAMEWORKS TO IMPROVE INFRASTRUCTURE GOVERNANCE AND CAPACITY

A variety of tools and guidance frameworks have been developed to facilitate upskilling and infrastructure governance capacity. The **World Bank's PPP Reference Guide** provides relevant examples and resources on key PPP topics, including: policy, legal, and institutional frameworks needed to ensure PPPs achieve their stated objectives, stakeholder communication and engagement, and conducting environmental and social due diligence (ADB et al. 2017).

APMG's PPP Certification Program (CP3P) serves as a comprehensive resource on all stages of successfully delivering PPPs, from the earliest stages of project identification and PPP screening to delivery and commissioning.³⁹

The **World Bank's Infrastructure Governance Assessment Framework** is a systematic approach to assess the governance requirements for quality infrastructure and provide actionable recommendations to advance policy change.⁴⁰

The **PPP Fiscal Risk Assessment Model (PFRAM)** offers an analytical tool developed by the IMF and WBG to assess fiscal costs and risks arising from PPP projects, designed to assist governments in assessing the fiscal implications of PPPs, as well as in proactively managing PPP projects.⁴¹

The **PPP Project Screening and Analytics Tool (PSAT)** is a decision-making tool for preliminary screening to determine projects' potential suitability for PPP procurement and project prioritization. The tool helps evaluate projects on qualitative and quantitative variables, and functions well both in situations of low and high information availability.⁴²

39 The APMG PPP Certification Program is an innovation of Asian Development Bank (ADB), European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IDB), Islamic Development Bank (IsDB), the Multilateral Investment Fund (MIF), and World Bank Group (WBG), and is partly funded by the Public-Private Infrastructure Advisory Facility (PPIAF). ADB et al. 2017.

40 WBG (World Bank Group). 2021. Infrastructure Governance: Assessment Framework (December 2020). <https://thedocs.worldbank.org/en/doc/96550c14d62154355b6edc367d4d7f33-0080012021/original/Infrastructure-Governance-Assessment-Framework-December-2020.pdf>

41 WBG (World Bank Group) and IMF (International Monetary Fund). 2019. "Public-Private Partnerships Fiscal Risk Assessment Model (PFRAM): Version 2.0." <https://ppp.worldbank.org/public-private-partnership/library/public-private-partnerships-fiscal-risk-assessment-model-pfram-version-2-0>.

42 WBG (World Bank Group) and PPIAF (Public-Private Infrastructure Advisory Facility). 2021. "PPP Project Screening and Analytics Tool." <https://ppp.worldbank.org/public-private-partnership/library/ppp-project-screening-and-analytics-tool-psat-user-guide>.

BOX 1.3: TOOLS, GUIDANCE, AND FRAMEWORKS TO IMPROVE INFRASTRUCTURE GOVERNANCE AND CAPACITY, CONTINUED

The **Framework for Disclosure in PPPs** recommends a systematic structure for proactively disclosing information, and is embedded in the findings of a global review of PPP disclosure frameworks and practices in transacted PPP contracts in identified jurisdictions.⁴³

Sources: World Bank, PPIAF, and APMG.

43 WBG (World Bank Group), OECD (Organisation for Economic Co-operation and Development), COST, and PPIAF (Public-Private Infrastructure Advisory Facility). 2016. "A Framework for Disclosure in PPPs." <https://library.pppknowledgehub.org/documents/5395/download>.

ACTION AREA 1.3

Build more effective institutional capacity by leveraging various initiatives, tools, and infrastructure governance frameworks developed by donors, IOs, and MDBs/DFIs—translating such capacity-building efforts into practice.

1.4 Enabling Investments by Institutional Investors

As regulatory focus expands from “financing green” to “greening the financial system,” loosening capital requirements may increase allocation to EMDE infrastructure at the margins; at the same time, financial regulators are assessing climate risks closely as regulations evolve. Institutional investors, such as pension funds and insurance companies, have few regulatory incentives to finance sustainable infrastructure directly, despite data suggesting that capital charges on infrastructure loans may be too high relative to long-term default rates.⁴⁴ Insurance regulations in developed markets other than the European Union (EU) treat infrastructure debt like long-term debt, ignoring the risk mitigants of project finance that do not benefit other debt instruments, such as warranties, insurance and offtake agreements.⁴⁵ Although pension funds frequently invest in listed vehicles for infrastructure investment, such as “yieldcos” and “green bonds,” only a few invest directly in infrastructure.

Emerging regulatory responses that support institutional investment in sustainable infrastructure include proposals to liberalize pension fund regulations to allow direct investments, and to assign different allocation limits to infrastructure versus other sectors (as in China, Croatia, and Romania).⁴⁶ EU Solvency II reforms have also lowered capital charges on insurance companies for qualifying infrastructure projects, a measure that merits consideration in other markets with large insurance segments. Yet stocktake interviews note that there is still room for further loosening of financial regulations as it relates to Solvency II, including adjustments to portfolio limits. For institutional

44 A discussion of the EU’s lowering of capital charges for infrastructure loans relative to the emerging Insurance Capital Standard, which does not yet consider the lower credit risk of infrastructure loans, can be found here: Hu, Zhen, and William Perraudin. 2020. *Client Report: Infrastructure Debt Capital Charges for Insurers*. Risk Control Limited. <https://www.riskcontrollimited.com/insights/infrastructure-debt-capital-charges-for-insurers/>.

45 Jobst, A. 2018. *Credit Risk Dynamics of Infrastructure Investment: Considerations for Financial Regulators*. Washington, DC: 2018. <https://dx.doi.org/10.2139/ssrn.3152977>.

46 Ibid.

investors, developing publicly listed sustainable infrastructure investment instruments, such as the tax-advantaged vehicles offered in Malaysia and Brazil, may also help promote sustainable infrastructure investments.^{47, 48}

ACTION AREA 1.4

G20 governments should continue to work with regulatory bodies to improve financial regulations to further enable and encourage institutional investors to invest in sustainable infrastructure assets in support of the climate change agenda and SDGs.

1.5 Promoting Standardized Sustainability Reporting

Another measure to lower barriers to private capital seeking sustainable infrastructure investments would require comparable, high quality and updated data, including disclosure of climate change risks, as recommended notably by the Task Force on Climate-Related Financial Disclosures (TCFD). In doing so, governments can facilitate financial analysis of low-carbon infrastructure investments and highlight integrity, transparency and forward-thinking, while addressing the risks of greenwashing. Governments can also use this data to evaluate and compare the long-term costs and benefits of sustainable versus conventional infrastructure. Such measures may provide a push for document standardization, more systematic project analysis and evaluation, and transparent and competitive procurement practices. This topic is further explored in Chapter 4.

Rules for issuers to report on climate and ESG issues, and taxonomies for sustainable activities are emerging globally following many years of development of market-led principles. National taxonomies include criteria for activities associated with the energy transition, social inclusion, and natural capital, as examples. It is too early to evaluate impacts, but by clarifying the use of capital deployed for sustainable infrastructure, these definitions may facilitate investment. Where national taxonomies build on market-based principles developed for a variety of sustainable debt instruments, such as those sponsored by the International Capital Markets Association (ICMA), they can aid market convergence and clarity.

Despite potential benefits of climate and ESG reporting, a recent EU assessment shows banks' climate disclosures falling short of expectations.⁴⁹ This is significant because of banks' dominance of infrastructure finance. Banks are under pressure to improve their reporting, and this pressure will eventually cascade to financed infrastructure assets. Of course, incorporating climate risk in financing for sustainable infrastructure will have costs and benefits for EMDEs, thus the potential risk of climate transparency driving higher borrowing costs in EMDEs should be monitored. However, not clarifying the physical and transition risks associated with climate change may have a greater negative impact by understating risks and potentially stranding assets. Governments will likely need to promote these disclosures to attract good private partners and the lowest cost of capital. Finally, governments will also need to standardize information to tap into carbon markets as a growing potential source of finance.

47 Borensztein, Eduardo, Eduardo Cavallo, and Pablo Pereira dos Santos. 2022. *Infrastructure Bonds: The Case of Brazil*. IDB (Inter-American Development Bank). <https://publications.iadb.org/publications/english/document/Infrastructure-Bonds.-The-Case-of-Brazil.pdf>.

48 Climate Bonds Initiative. 2020. *Green Infrastructure Investment Opportunities: Malaysia*. Climate Bonds Initiative. https://www.climatebonds.net/files/reports/cbi_giio_malaysia_20_03_bbd.pdf.

49 ECB (European Central Bank). 2022. "Banks Must Get Better at Disclosing Climate Risks, ECB Assessment Shows." ECB (press release), March 2022. [https://www.bankingsupervision.europa.eu/press/pr/date/2022/html/ssm.pr220314\\$~\\$37303fd463.en.html](https://www.bankingsupervision.europa.eu/press/pr/date/2022/html/ssm.pr220314$~$37303fd463.en.html).

The impact on EMDEs will depend on the availability, transparency, integrity and usability of data to support investors' sustainability claims (Box 1.4).

BOX 1.4: CLIMATE DISCLOSURE AND TAXONOMY — EXAMPLES FROM THE EU AND CHINA

The **EU's Sustainable Finance Disclosure Regulation**⁵⁰ and taxonomy⁵¹ and its Corporate Sustainability Reporting Directive will have far-reaching effects, as has China's Green Bond Endorsed Project Catalogue,⁵² in combatting greenwashing and targeting desired activities.

As the first projects of law in the world to take aim at greenwashing and improving transparency in sustainable investment products, these regulations will force investment managers and issuers to clarify their climate credentials against rigorous, sector-specific criteria. These projects will also help governments influence how capital flows toward green and low-carbon development priorities, such as growing domestic green finance.

Emerging national variations are encouraging global coordination, as with the proposed **China-EU Common Ground Taxonomy (CGT)**, a comparative study of China's and the EU's green taxonomies published by the International Platform on Sustainable Finance (IPSF) on November 4, 2021, at the 2021 United Nations Climate Change Conference (COP26).⁵³

Because infrastructure is an important destination for sustainable investment capital, the CGT's mission to assess existing taxonomies and identify commonalities and differences in their methodologies and outcomes will affect what type of infrastructure projects can mobilize capital with climate or other sustainability goals.

Sources: European Commission, Central Bank of the People's Republic of China.

50 European Commission. 2018. Regulation on Sustainability-Related Disclosure in the Financial Services Sector. European Commission. https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/sustainability-related-disclosure-financial-services-sector_en.

51 European Commission. 2022. "EU Taxonomy for Sustainable Activities." Accessed 6 July 2022 https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en.

52 PBOC (People's Bank of China). 2021. "Catalogue of Green Bond Endorsed Projects (2021 Edition)." PBOC. <http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4342400/2021091617180089879.pdf>.

53 IPFS (International Platform on Sustainable Finance). 2020. *Common Ground Taxonomy—Climate Change Mitigation: Instruction Report*. https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/211104-ipsf-common-ground-taxonomy-instruction-report-2021_en.pdf.

ACTION AREA 1.5

Assist EMDE governments to adopt and implement climate and ESG reporting requirements aligned with global standards and taxonomies to point the way to which investments are aligned with climate and broader sustainability goals.

1.6 Fostering the Energy Transitions

Low-carbon transitions are already disrupting the livelihoods of workers in countries that rely on fossil fuels—not only in coal mining and coal-fired power plants but also, for instance, in public transport.⁵⁴ In EMDEs such as South Africa and India, the complex dialogue between coal workers, coal companies, and government has been ongoing for more than a decade.

One of the most important examples in EMDEs to date comes from the recent announcement of the Just Energy Transition Partnership (JETP) at COP26. South Africa’s ambitious NDC submission prompted a pledge of \$8.5 billion from bilateral donors for equitable decarbonization. In developed economies, fiscal constraints are less binding; the EU’s Just Transition Fund can offer grant funding, as well as a range of financial instruments from InvestEU and the European Investment Bank (EIB) for social, economic and environmental rehabilitation in transition-affected territories.⁵⁵ Case studies at the Just Transition Initiative⁵⁶ and World Resources Institute⁵⁷ show the breadth and intensity of private, public and citizen sector stakeholder participation and the range of options from narrow, incremental approaches (e.g., retraining for affected workers in the renewables industry), to more transformative approaches (e.g., regional and municipal economic development, improved livelihoods from ecological regeneration).

MDB/DFIs’, IOs’, and donors’ energy transition programs appear to be ramping up with climate commitments and by changing donor policies (such as the US Treasury’s 2021 guidance on limiting support to MDB fossil fuels projects⁵⁸). Indeed, 2020 was pivotal for MDBs’ clean energy finance, the first year ever with no coal financing.⁵⁹ The Asian Development Bank’s (ADB) new policy exits financing of new coal and oil projects⁶⁰ and its Energy Transition Mechanism is piloting coal plant decommissioning.⁶¹ The Energy Sector Management Assistance Program (ESMAP) suggests increased demand for support under its Energy Subsidy Reform Facility (ESRF) with the Energy Subsidy Reform Assessment Framework (ESRAF).⁶² Likewise, it is advising India and South Africa (two of the world’s largest coal producers) on coal plant closing and repurposing. However, how to effectively encourage private sector participation and the mobilization of private capital to support the energy transition agenda remains a major challenge.

54 Bogota’s bus rapid transit (BRT) project both delivered innovative, efficient, inclusive service and replaced informal bus workers and privately owned transport small and medium enterprises (SMEs) at a high rate.

OECD (Organisation for Economic Co-operation and Development). 2017. *Investing in Climate, Investing in Growth*. Paris: OECD. <https://doi.org/10.1787/9789264273528-en>.

55 EU (European Union). 2022. “Just Transition Fund.” Accessed July 6, 2022. https://ec.europa.eu/info/funding-tenders/find-funding/eu-funding-programmes/just-transition-fund_en.

56 JTI (Just Transition Initiative). 2022. Resources Library. Accessed July 6, 2022. <https://justtransitioninitiative.org/resource-library/>.

57 WRI (World Resources Institute). 2022. “Just Transitions and Equitable Climate Action Resource Center: Snapshots.” Accessed July 6, 2022. <https://www.wri.org/just-transitions/snapshots>.

58 US Department of the Treasury. 2021. “Treasury Announces Fossil Fuel Energy Guidance for Multilateral Development Banks.” US Department of the Treasury (press release), August 16, 2021. <https://home.treasury.gov/news/press-releases/jy0323>.

59 IISD. 2021. “Fossil Finance from Multilateral Development Banks Reached USD 3 Billion in 2020, but Coal Excluded for the First Time Ever.” IISD (blog), March 30, 2021. <https://www.iisd.org/articles/press-release/fossil-finance-multilateral-development-banks-reached-usd-3-billion-2020>.

60 ADB (Asian Development Bank). 2021. “New ADB Energy Policy to Support Energy Access and Low-Carbon Transition in Asia and Pacific.” ADB (news release), October 20, 2021. <https://www.adb.org/news/new-adb-energy-policy-support-energy-access-and-low-carbon-transition-asia-and-pacific>.

61 ADB (Asian Development Bank). 2022. “Asia and the Pacific’s Climate Bank—Energy Transition Mechanism (ETM).” Accessed August 4, 2022. <https://www.adb.org/what-we-do/energy-transition-mechanism-etm#launch>.

62 ESMAP. 2022. “Foundations for The Energy Transition—Energy Subsidy Reform Facility.” World Bank ESMAP, accessed August 4, 2022. https://www.esmap.org/energy_subsidy_reform.

Cutting energy subsidies — Governments must reduce fossil fuels subsidies and replace them with carbon taxes to signal needed investments in low-carbon infrastructure and to direct fiscal resources to market creation, new technologies and just energy transitions. Nonetheless, a range of new fiscal measures in the wake of energy price hikes due to the war in Ukraine⁴⁶ have returned fossil fuel subsidies nearly to pre-COVID-19 2018 levels.⁴⁷ Fossil fuel subsidies are expected to increase again in 2022⁴⁸ because the IMF also projects subsidies to rise from 6.8 percent of global gross domestic product (GDP) in 2020 to 7.4 percent of GDP by 2025.⁴⁹ These data highlight recent years' intensified tracking and analysis of energy subsidies, as well as increased support to governments navigating these politically and socially complex reforms.

Carbon pricing and markets — Carbon taxes and markets are the critical counterpart to phase downs in fossil fuel subsidies. A 2021 International Institute for Sustainable Development (IISD) report shows that gradual reductions in subsidies and similar phase-ins of carbon taxes can double average emissions reductions from 6 percent to almost 12 percent by 2030 in countries accounting for 77 percent of carbon emissions, while generating cumulative fiscal savings of almost \$3 trillion.⁵⁵ A widely cited estimate suggests that carbon trading could reduce by more than half the cost of implementing NDCs.⁵⁶

Compliance and voluntary carbon markets have grown rapidly in the past two years alone, showing the potential for policy-driven market creation and innovation. According to the World Bank, 2021 witnessed record global carbon pricing revenues of \$84 billion in 2021, with developing market infrastructure and more EMDE governments, including China, advancing carbon pricing.⁵⁷ A total of 68 carbon pricing initiatives at both the national and sub-national levels, which represent 23 percent of global emissions in 2022, were identified globally.⁵⁸ Significantly, the EU's carbon border tax will be the first to price emissions embedded in imports when it goes into full effect in 2026.

Carbon markets still deliver weak signals; a recent World Bank analysis proposes carbon taxation with green bonds issuance to simultaneously raise the cost of emissions-intensive infrastructure and also invest in low carbon capacity and innovation.⁵⁹ As carbon markets are created by governments, international collaboration to improve market integrity and complementary government policy for decarbonization need to be prioritized.

ACTION AREA 1.6

G20 governments should assist EMDEs in developing strategies to remove fossil fuel subsidies, as well as deploy policy levers and incentives to support the transition towards a sustainable COVID-19 recovery.



CHAPTER 2

Preparing and Delivering a Pipeline of Sustainable Infrastructure Projects

2.1 The Current Gaps and Importance of Project Preparation in EMDEs

The lack of properly prepared projects is a well-recognized barrier to mobilizing private capital by banks, fund managers and institutional investors. This problem has been a focus of attention for the G20 and other global fora for many years, with an increased intention to strengthen project preparation and reinforce linkages between policy and regulatory frameworks and improve collaboration among MDBs/DFIs.⁶³

In a recent analysis conducted by J.P. Morgan of EMDE greenfield projects on industry databases, it was found that there is an estimated pipeline of approximately \$1.2 trillion in “investable” sustainable infrastructure projects—only half of the EMDEs’ estimated annual sustainable infrastructure investment needs. Even worse, many of these “investable” projects are still in very early stages of development and will not be “shovel ready” for years to come.⁶⁴ Yet, the ability to fill that gap is jeopardized by inadequate resources for project preparation: the estimated time for project preparation and structuring can vary significantly depending on the circumstances and readiness of each project, but generally ranges from three to eight years, with six years as an average⁶⁵ and roughly accounts for 5 to 10 percent of total project investment from project conception to commercial and financial closures. Thus, in order to meet the estimates of

63 G7 (Group of Seven). 2022. “G7 Leaders’ Communiqué.” G7 Germany, June 28, 2022. <https://www.consilium.europa.eu/media/57555/2022-06-28-leaders-communication-data.pdf>.

64 Based on JPMorgan analysis cited in: Zelikow, Daniel, and Fuat Savas. 2022. “Mind the gap: Time to rethink infrastructure finance.” GIF (Global Infrastructure Facility) (blog), May 20, 2022. <https://blogs.worldbank.org/ppps/mind-gap-time-rethink-infrastructure-finance>.

65 IMF (International Monetary Fund). 2020. *Fiscal Monitor: Policies for the Recovery*. Washington, DC: IMF.

\$3 trillion annual investment needed by 2050—even assuming only 1 percent of which is required for project preparation—at least \$30 billion annual funding would be needed for project preparation.

This is further compounded by weak institutional capacity to take on the increasingly complex dimensions of project development. Quality infrastructure project preparation requires comprehensive economic, financial, technical, and project management skills, as well as a firm understanding of the private sector if mobilizing private capital is also a desired outcome. Such skills and capacity are universally lacking in many EMDEs due to a shortage of available resources. According to GIH's *Infrastructure Monitor 2021*, there is a need to improve project preparation capability in almost all regions, particularly in LICs. Compounding capacity gaps, the fiscal and social constraints that many governments currently face often make shortcuts—in terms of reduced project preparation efforts and weakened controls—much more attractive.⁶⁶

Project preparation is not only important in addressing the lack of bankable projects or pipelines, but is also critical to ensure the long term viability and quality of the infrastructure asset because the best time to address and incorporate sustainability considerations (e.g., climate resilience and adaptation, gender, InfraTech, fiscal impacts, among other themes) is during the project development and preparation phase before it becomes a missed opportunity that could be very costly to remedy given the long term nature of infrastructure assets.

In addition, funding of project preparation yields enormous benefits. The Inter-American Development Bank (IDB) points to the costs of incomplete project preparation support, estimating that 80 percent of project cost overruns can be attributed to land use disputes, while environmental conflicts in a project can cause cost overages of up to 70 percent, leading to delays of up to 13 years.⁶⁷

2.2 The Role of Project Preparation Facilities⁶⁸

To help fill the EMDE infrastructure gap, PPFs—with dedicated resources and skills—must play a critical role in preparing and delivering bankable projects to finance providers.

Figure 2.1 below details the scope of services/activities along the development value chain which the GIF defines/considers as “project preparation.” To that end, for this stocktake, we include only global and national dedicated project preparation funds or facilities which focus on the full scope of project preparation and development from prefeasibility to commercial or financial close.

66 The example of the dedicated electrified bus route Eje 8 Sur in Mexico City shows how diesel buses would have been selected on upfront price alone whereas the total life-cycle cost analysis of electric buses showed their longer life, their lower cost operation, and better environmental impacts. Walker, Oliver, and Moro Aris. 2019. “Electrifying Bus Routes: Insights from Mexico City’s Eje 8 Sur, Technology Assessment.” C40CFF (C40 Cities Finance Facility). <https://www.c40cff.org/knowledge-library/electrifying-bus-routes-insights-from-mexico-citys-eje-8-sur>.

67 Alemán, Ancor Suárez, Mariana Silva Zúñiga, and INERCO Consultoría. 2020. *Identificando Mejoras de Eficiencia En La Preparación de Los Componentes Ambientales, Prediales, y Sociales de Las Asociaciones Público-Privadas y Obra Pública Tradicional En América Latina y El Caribe*. Washington, DC: IDB (Inter-American Development Bank). <https://publications.iadb.org/publications/spanish/document/Hacia-una-preparacion-eficiente-y-sostenible-de-proyectos-de-infraestructura.pdf>.

68 Although this stocktake highlights the important role of public sector led PPFs in infrastructure project preparation, especially for large, capital intensive infrastructure assets, it is acknowledged that the private sector also plays a significant role in infrastructure project development and preparation, especially for small- and medium-sized projects. Some PPFs can also work with or support the private sector’s project development efforts and find ways to address concerns often raised around transparency and cost competitiveness, among other areas of support.

FIGURE 2.1: PROJECT PREPARATION CYCLE



Although studies have identified 68 to 150 PPFs with varying strategies, focus areas, sizes, and business models,⁶⁹ it is hard to tell how many of these PPFs are dedicated to the full scope of sustainable infrastructure project preparation, or are only contributing or have relevance to some parts of infrastructure project preparation or development along the infrastructure development value chain. This distinction can often be difficult to ascertain because the definition of PPFs is not clear in these studies, and detailed data on PPF size, scope of work, and impact are available for only a small proportion of PPFs. For example, many PPFs appear to only work upstream on policy advice and enabling environment barriers, or limit their scope of support to feasibility studies. Preliminary studies on existing PPFs suggest that there is a tension between the relatively small size of PPFs and the more outsized demands of infrastructure project preparation. Moreover, fragmentation of PPFs in the market, and the efficiency and effectiveness of how scarce project preparation resources have been deployed remain longstanding issues. More data and further examination of these PPFs is needed to fully appreciate the state of project preparation in EMDEs. Such data would also help to avoid the false perceptions that there are already plenty of resources and skills dedicated to sustainable infrastructure project preparation through the seemingly large ecosystem of existing PPFs.

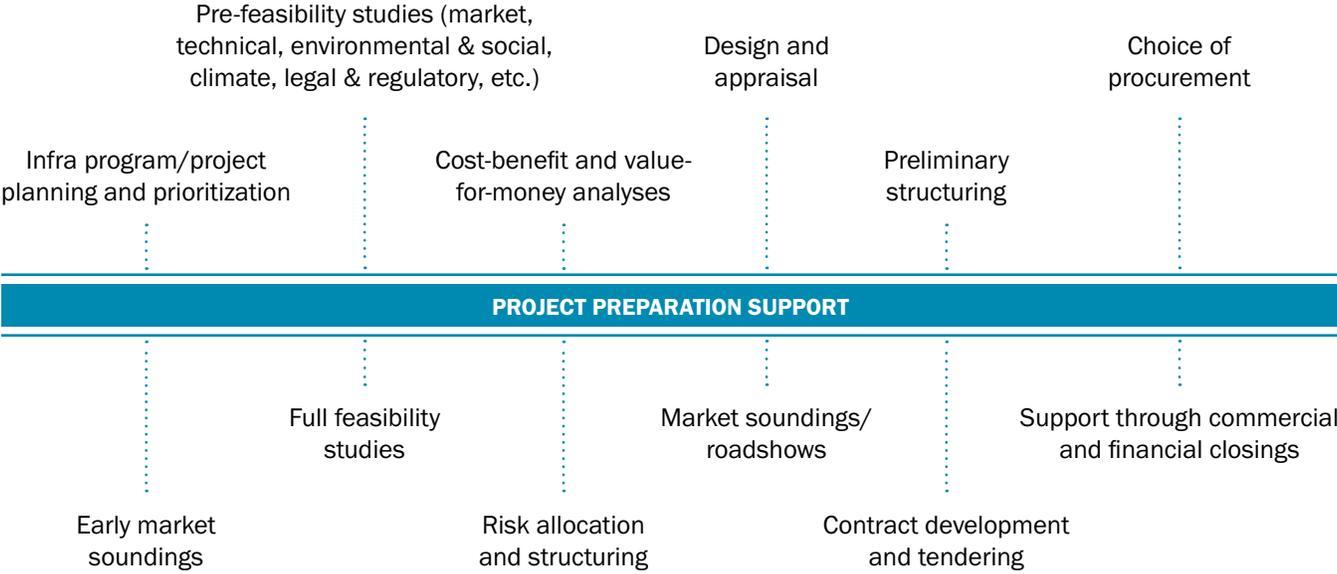
Although PPFs retain in-house capacity, those with an explicit focus on preparing projects to attract private sector investments in sustainable infrastructure operate by hiring in/procuring external advisory services to provide project preparation support. Beyond the current industry expertise they provide (i.e., technical, legal, financial commercial, and ESG), the use of external transaction advisory services/firms signals to the market (developers, technology/equipment suppliers, sponsors, lenders, among other participants) the standard/quality of preparation that a project/program has undergone and therefore the likelihood of success.

PPFs have been critical to mobilizing private capital/investment into renewable energy assets/ infrastructure in EMDE countries (e.g., South Africa, Morocco and India). Beyond the energy sector, PPFs have successfully supported EMDE governments to prepare, structure and procure private investment into innovative sustainable infrastructure projects in the transport (mass transit, freight transport) and water sectors.

Despite their significance and proven value addition, there is consensus, based on data from large PPFs, that resources deployed to prepare sustainable infrastructure projects are inadequate to the enormity of the goal to rapidly grow a bankable pipeline of such projects. The IDB asserts that only a small

69 Pickard, Sam, Shelagh Whitley, and Andrew Scott. 2018. *Clean Energy Project Preparation Facilities: Mapping the Global Landscape*. ODI. <https://cdn.odi.org/media/documents/12504.pdf>.

FIGURE 2.2: SCOPE OF PROJECT PREPARATION SUPPORT



fraction of total donor funding and technical assistance (TA) are dedicated to project preparation—and only 0.2 percent of total enabling environment operations and lending went to project preparation activities in the 2006-2015 period.⁷⁰ This may partly explain the fact that despite the enormous amount of resources and efforts by MDBs devoted to upstream technical assistance in EMDEs, only a small fraction of these efforts has translated into pipelines of bankable projects.

More funding, resources, and support for PPFs—particularly those with strong track records—are critical to scale and deliver large projects ready to be financed. That funding must be aimed at increasing the number and size of bankable quality infrastructure projects, and promoting programmatic, replicable approaches (where appropriate) to yield standardized projects for financing. With such funding, PPFs must embrace a widening range of business priorities, including analyses of addressable markets, efficient execution, climate change, environmental and social impact, evolving technology and, critically, bankability and finance.⁷¹ PPFs also need additional sector and transactional experience to deliver better outcomes.

The current fiscal environment has caused the diversion of funds away from PPFs, rendering it difficult for PPFs to continue to scale-up support for the preparation of quality and bankable infrastructure project pipelines/programs. Various sources point to a need for larger preparation and TA budgets

70 Fioravanti, Reinaldo, Carolina Lembo, and Akash Deep. 2019. *Filling the Infrastructure Investment Gap: The Role of Project Preparation and Structuring Facilities*. Washington, DC: IDB (Inter-American Development Bank). <https://doi.org/10.18235/0001590>.
 71 Similar success factors are mentioned in various publications. Relevancy and effectiveness, efficiency, co-benefits to communities, financial viability and sustainability are mentioned in Oberholzer et al., “Summary of Good Practice of Successful Project Preparation Facilities.”
 For more on the value of project preparation activities when well structured, see WEF (World Economic Forum). 2015. *Infrastructure Project Preparation Facilities: A New-Principled Approach*. Africa Strategic Infrastructure Initiative, WEF, Switzerland. <https://reports.weforum.org/africa-strategic-infrastructure-initiative>.

to deliver necessary legal and regulatory reforms and transactional support.⁷² Interviews conducted during the stocktake underline that early-stage capital is essential and thus suggests a need for both more innovative and efficient use of resources such as recovery or reimbursement of project preparation funding costs for certain projects in certain markets.

Pooled resources, vertical integration or one-stop-shop approaches and collaboration on large, transformational projects were also suggested to increase the impact of PPFs while coalescing around more coordinated programs.⁷³

ACTION AREA 2.1

In response to consistent feedback from the private sector and MDBs/DFIs, donors should consolidate their resources and scale up funding support to PPFs and other similar initiatives to fundamentally address the lack of bankable projects—one of the top binding constraints to mobilize private capital.

2.3 Role of MDBs in Project Preparation

MDBs, with their unique combination of financial resources and technical expertise, have responded to the project preparation challenge by anchoring and supporting key regional and global PPFs to support EMDEs. There is, however, the need for MDBs to play a much bigger role in project preparation, given significant increases in project preparation costs in recent years as a result of emerging sustainability, regulation, inclusion, and technology requirements, among others.⁷⁴

To that end, it is critical to strengthen knowledge, resources, and skills related to project preparation—within both national governments and MDBs/DFIs. Whereas EMDE governments should continue allocating more resources and political support towards project preparation efforts, MDBs/DFIs—given their comparative advantage in technical expertise, financing instruments available, and relationships with client governments—should assume a more significant role in this space. For example, MDBs/DFIs can scale up project preparation efforts and co-financing infrastructure investment with national PPFs, providing more technical support to national governments' efforts. As such, MDBs/DFIs, as trusted advisors to governments, can fill in resource and capacity gaps that EMDE governments often lack. Ultimately, such a role can lead to a bigger impact and bring more projects to market, while also building capacity for EMDE governments through partnership in real transactions that both build and transfer critical knowledge.

72 Three evaluations of PPFs since 2018 consulted for the stocktake make reference to the programmatic constraints, budgetary challenges and need to operationalize analysis of ESG issues: Oberholzer, Basel, Katharina Schneider-Roos, Charlotte Boulanger, and Maryke van Staden. 2018. *City Climate Finance Leadership Alliance (CCFLA): Summary of Good Practice of Successful Project Preparation Facilities*. ICLEI World Congress. <https://worldcongress2018.iclei.org/wp-content/uploads/Summary-of-good-practice-of-successful-project-preparation-facilities.pdf>; Eriksson, Mats, and Said Sadat. 2020. *Capacity-Building Needs Assessment to Enhance Financing for Water Infrastructure Projects in Africa; Presentation of Six Cases*. Africa-EU Water Partnership Project Report, Stockholm International Water Institute. https://siwi.org/wp-content/uploads/2020/10/aewpp_kp_capacitybuilding_final_web.pdf; Finlayson, Bob. 2018. *Thematic Evaluation: Infrastructure Project Preparation Facility (IPPF)*. London, EBRD (European Bank for Reconstruction and Development). <https://www.ebrd.com/documents/evaluation/evaluation-infrastructure-project-preparation.pdf>.

73 African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, IFAD, Islamic Development Bank, Inter-American Bank, and World Bank. 2015. "Partnering to Build a Better World: MDBs' Common Approaches to Supporting Infrastructure Development." G20 (Group of Twenty). <http://g20.org.tr/wp-content/uploads/2015/11/Paper-on-MDB-Common-Approaches-to-Supporting-Infrastructure-Development.pdf>.

74 GIH (Global Infrastructure Hub). 2021. *Infrastructure Monitor 2021*. GIH. <https://www.gihub.org/infrastructure-monitor/>

Successes in attaining significant private sector investment in the renewable energy sector across multiple EMDEs highlighted in Box 2.1 below illustrate MDB efforts in scaling and replication from proof-of-concept projects; linkages between upstream reforms (legal, regulatory and enabling environment), project preparation and project finance; and the building of government capacity.

BOX 2.1: EXAMPLES OF MDBS' SYSTEMIC AND STANDARDIZED APPROACHES TO SCALE INFRASTRUCTURE

WBG's Scaling Solar and Mini-Grids initiatives demonstrate that programmatic approaches and standardization can boost investment and build scalability. Early successes in Africa are now being translated to other regions and countries, like Uzbekistan, and that investment in sector focus and standardization can be replicated.⁷⁵

In addition, similar approaches are delivering pioneering energy projects where business models and regulatory frameworks are in development and technologies (and access to them) are in earlier stages, such as in geothermal energy projects such as the **GIF/WB Indonesia Geothermal Resource Risk Mitigation (GREM) Facility**.⁷⁶

Various initiatives in the transport sector show some movement in the same direction, such as the **IFC's Dakar Bus Rapid Transit (BRT) project**, the first in Francophone Africa, is one of several municipal level mass transit transport projects supported by the GIF.⁷⁷

In addition, the **IFC and GIF have partnered with Caixa**, the national development bank, to support the Brazilian government in the structuring and procurement of street lighting PPPs in up to 15 Brazilian municipalities, developing a standard approach to structuring the PPP transactions with standardized contract templates that helped build national project preparation capacity through the partnership with Caixa.⁷⁸ This standardized approach is being replicated by the Private Infrastructure Development Group (PIDG) in the street-lighting program in Nairobi, Kenya.

Sources: World Bank Group, ADB, EBRD, GIF, PIDG.

75 IFC (International Finance Corporation). 2022. "Scaling Mini-Grid (SMG)." IFC, accessed July 5, 2022. https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/infrastructure/priorities/power/scaling+mini-grid.

76 Global Infrastructure Facility. "Projects." <https://www.globalinfrafacility.org/projects?#>.

77 Ibid.

78 GIF (Global Infrastructure Facility). 2020. *Street Lighting Impacts in Brazil—Final Report*. GIF. <https://www.globalinfrafacility.org/knowledge/street-lighting-impacts-brazil-final-report>.

ACTION AREA 2.2

MDBs should continue to step up their project preparation efforts by leveraging their comparative advantages in resources and technical skills, including supporting national governments and national PPFs through co-financing or co-led efforts, which can facilitate effective knowledge transfer and capacity building.

2.4 Project Preparation Capacity Building

Infrastructure practitioners point to a dearth of expertise in national PPFs or PPP units and elsewhere in government—gaps that range from basic financial and administrative capacity to more complex legal, technical, social and environmental issues.⁷⁹ On administrative capacity, government engagement may be inhibited by a lack of high-level and continuous guidance because advisory support may be considered beyond budgetary resources due to advisor engagement at the project rather than at the institutional or program level.⁸⁰

A range of project preparation tools have been developed—and continue to be launched and integrated into operations—by MDBs/DFIs and IOs, to advance the SDGs. Additionally, platforms consisting of infrastructure project preparation guidance and transactions have entered the market to strengthen the capacity of project developers.



-
- 79 A wide range of capacity gaps from the most basic financial and administrative to more complex legal, technical, social, and environmental are highlighted in: Eriksson, Mats, and Said Sadat. 2020. *Capacity-Building Needs Assessment to Enhance Financing for Water Infrastructure Projects in Africa; Presentation of Six Cases*. Africa-EU Water Partnership Project Report, Stockholm International Water Institute. https://siwi.org/wp-content/uploads/2020/10/aewpp_kp_capacitybuilding_final_web.pdf.
- 80 This EBRD document suggests advisors be embedded to support a range of strategic and implementation issues in a report by Finlayson, *Infrastructure Project Preparation Facility (IPPF)*.

BOX 2.2: EXAMPLES OF PROJECT PREPARATION PLATFORMS AND INFRASTRUCTURE PROJECT DATABASES

The proliferation and scale of project preparation platforms have helped improve project preparation management capacities and source data on global infrastructure pipelines.

SOURCE—a digitized quality infrastructure project preparation management platform **launched by the Sustainable Infrastructure Foundation** that has received support from the African Development Bank (AfDB), ADB, EBRD, EIB, WBG, and IDB—serves as a centralized repository of templates, resources, and data designed to promote high quality and efficient global infrastructure project delivery.⁸¹

The **World Bank PPP Group's Private Participation in Infrastructure (PPI) Database** provides information on more than 100,000 infrastructure projects with more than 50 fields per project record, and also disseminates information on PPI projects in LICs and MICs, highlighting the contractual arrangements used to attract private investment, sources and destination of investment flows, and information on the main investors.⁸²

The **Multilateral Cooperation Center for Development Finance (MCDF) JIGSAW** platform offers a collaboration tool for project owners to input their project information and preferences into a centralized database, enable project matching, and share information on investment policies, standards, capacity building and collaboration needs, and investment environment information.⁸³

Sources: Sustainable Infrastructure Foundation, World Bank, MCDF.

81 Sustainable Infrastructure Foundation. "SOURCE: The Multilateral Platform for Sustainable Infrastructure." <https://public.sif-source.org/source/>.

82 World Bank Public-Private Partnership Legal Resource Center. 2021. "PPI Database." June 10, 2021. <https://ppp.worldbank.org/public-private-partnership/library/private-participation-infrastructure-ppi-database>.

83 MCDF. "JIGSAW, MCDF's Digital Solution for High Quality Connectivity Infrastructure." <https://www.themcdf.org/en/what-we-do/information-sharing/activities/JIGSAW-MCDF-s-digital-solution-for-advancing-quality-connectivity-infrastructure.html>.

MDBs and IOs have developed many tools aiming to strengthen EMDE capacity in project preparation. Examples of these include the G20's Principles for the Infrastructure Project Preparation Phase, the IMF and World Bank's PPP Fiscal Risk Assessment Model (PFRAM), and the World Bank, PPIAF and GIF's Guidance on PPP Contractual Provisions, among others.

In addition, conventional considerations for technical and economic/financial feasibility of projects, government entities preparing projects and PPFs must fully integrate sustainability considerations such as the QII Principles at the earliest stages of concept and program development. These dimensions are critical to strategic long-term planning in the face of fiscal constraints, supply chain bottlenecks, goods inflation and rising rates. Likewise, clear consideration of ESG integration are increasingly required downstream by banks and investors. Interviewees emphasized the potential to leverage ESG integration as an opportunity to improve project preparation, adding that these dimensions

yield benefits in the medium-to-long term. Box 2.3 provides examples of MDB and donor developed sustainable project preparation toolkits.

BOX 2.3: EXAMPLES OF MDB- AND DONOR-LED CLIMATE TOOLS IN SUSTAINABLE PROJECT PREPARATION

MDBs and donors have launched capacity-building tools, especially in the past two years, to embed climate action in the preparation of sustainable infrastructure projects and to support government implementing agencies in developing local capacity. The **PPIAF's Climate Resilience & Environmental Sustainability Technical Advisory (CREST) program**,⁸⁴ the **IDB Climate Resilient PPPs: Toolkit for Decision Makers**⁸⁵ and the recently launched **World Bank Climate Toolkits for Infrastructure PPPs**⁸⁶ offer structured approaches to ensuring that climate considerations are integrated across the project life cycle; workshops focused on public sector PPP clients and EMDE government representatives have helped to continue building capacity and applications of the toolkits for their respective infrastructure pipelines.⁸⁷ The World Bank, GIF, and PPIAF are also jointly developing an institutional gender toolkit and GIF is leading on an InfraTech toolkit. The **US Commercial Law Development Program's Energy Transition** practice leads applied trainings of government officials.⁸⁸

Sources: GIF, IADB, World Bank, ADB, CCRI, CFAN, US Department of Commerce.

84 PPIAF (Public-Private Infrastructure Advisory Facility). "Climate Resilience & Environmental Sustainability Technical Advisory." World Bank. <https://ppiaf.org/program/climate-resilience-environmental-sustainability-technical-advisory-crest>.

85 IDB (Inter-American Development Bank). 2022. Climate Resilient PPPs: Toolkits for Infrastructure PPPs. IDB. <https://publications.iadb.org/publications/english/document/Climate-Resilient-Public-Private-Partnerships-A-Toolkit-for-Decision-Makers.pdf>.

86 World Bank. 2022. *Climate Toolkits for Infrastructure PPPs*. World Bank, accessed June 25, 2022. <https://openknowledge.worldbank.org/bitstream/handle/10986/37287/P1746330d584ff0210a9670dcf49a5becb0.pdf?sequence=1&isAllowed=y>.

87 World Bank. 2022. *Climate Toolkits for Infrastructure PPPs*. World Bank, accessed June 25, 2022. <https://openknowledge.worldbank.org/bitstream/handle/10986/37287/P1746330d584ff0210a9670dcf49a5becb0.pdf?sequence=1&isAllowed=y>.

88 US Commercial Law Development Program. 2022. "Energy Transition." US Commercial Law Development Program training content, accessed 6 July 2022. <https://cldp.doc.gov/areas-expertise/energy-transition>.

Nonetheless, these efforts add costs and technical complexity, require training and demand coordination. For governments, this represents a critical challenge—to prepare and implement projects more systematically, to effect organizational change, to build in-house technical expertise and to gain a better understanding of market participants' and investors' needs.

Despite these tools and their dissemination being critical efforts for capacity building, skepticism surfaces in research and interviews in regard to how effectively mainstream knowledge tools have been used by practitioners in EMDEs, or whether the tools have translated into real capacity as it relates to accelerating project origination, development, and preparation, in the absence of additional capacity-building support.

The hands-on learning and network building needed to address public sector project preparation capacity constraints requires dedicated embedded advisors to build long-term capacity through

learning-by-doing and deliberate knowledge transfer complemented by formal training programs/certifications.

When organized and implemented appropriately, project preparation can lead to organizational change, building institutional knowledge and in-house technical expertise. The goal of the donor community/G20, and especially the MDBs and their PPFs, should therefore be to transcend mere dissemination of tools and on-demand project preparation support, to working wholistically with EMDE governments to achieve real institutional change and retain the requisite capacity for preparing bankable sustainable infrastructure programs.

ACTION AREA 2.3

G20 members, the donor community, and MDBs/DFIs and their respective PPFs should encourage a more hands-on approach to achieve higher capacity building impacts in EMDE governments—through not only knowledge transfer, but also through co-financing or co-development of projects with local partners in real time.

2.5 Project Preparation for Sub-National Sustainable Infrastructure

Subnational governments and cities in particular deserve special attention for their density, population growth and their emissions and energy use—two-thirds of global energy consumption and more than 70 percent of annual global carbon emissions.⁸⁹ Yet, they have unique challenges in raising private capital for sustainable infrastructure and generally need credit support from the central government or third parties, because most municipalities have no or low credit ratings on a stand-alone basis. At the same time, cities' scale and density present an opportunity for greater impact/outcomes with the development and implementation of sustainable infrastructure investments such as municipal solid waste management, wastewater treatment and reuse, distributed renewable energy programs, green buildings and energy efficiency programs, and mass transit/public transport projects.

Project preparation support to cities must help fill gaps and inform the legal and regulatory environment, coordinate with national efforts, develop civil society, improve local implementation, and improve creditworthiness.⁹⁰ In larger EMDEs with many local governments and municipalities, more bespoke project preparation support is needed for standardization and aggregation of sustainable infrastructure investments. Recognizing the unique opportunities inherent to cities/sub-nationals, stakeholders beyond traditional/mainstream PPFs have been coordinating to deliver project preparation support (Box 2.4).

⁸⁹ IEA. 2021. "Empowering Cities for a Net Zero Future." IEA. <https://www.iea.org/reports/empowering-cities-for-a-net-zero-future>.

⁹⁰ See the analysis of PPFs focused on cities in report by Oberholzer et al., *Summary of Good Practice of Successful Project Preparation Facilities*.

BOX 2.4: EXAMPLES OF COORDINATION AMONG STAKEHOLDERS FOR URBAN SUSTAINABLE INFRASTRUCTURE

Philanthropy, banks and corporates (including their foundations) and impact investors are increasingly complementing project preparation in cities and sub-national authorities, as are non-governmental organizations (NGOs) and private entities, for sustainable urban investment. Examples include the US-India Clean Energy Finance (USICEF),⁹¹ the C40 Cities Finance Facility,⁹² ICLEI's Transformative Actions Program⁹³ and CDP Cities' Matchmaker program.⁹⁴ As an example of coordination, cities can access these programs via a harmonized application created by the Cities Climate Finance Leadership Alliance (CCFLA).⁹⁵

Sources: UNICEF, C40 Cities, CDP, ICLEI, CCFLA.

91 USAID. "US-India Clean Energy Finance." <https://www.usicef.org/>.

92 C40 Cities. "The C40 Cities Finance Facility." <https://www.c40cff.org/>.

93 ICLEI. "Transformative Actions Program." <https://tap-potential.org/>.

94 CDP. "CDP Cities' Matchmaker program." <https://www.cdp.net/en/cities/matchmaker>.

95 Cities Climate Finance Leadership Alliance. "Harmonized Application for Project Preparation Facilities." <https://citiesclimatefinance.org/news-and-events/alliance-members-create-harmonized-application-for-project-preparation-facilities/>.

ACTION AREA 2.4

More project preparation resources should be directed towards supporting sub-national, regional, and local authorities, to develop sustainable projects and innovative financing solutions for increased sustainability impacts and outcomes at the subnational-level.

2.6 Ensuring Sustainability and High Quality in Project Preparation

To advance the SDGs and achieve the goals of the Paris Climate Accords, governments and PPFs should elevate sustainability considerations throughout the project life cycle. Climate, gender, and the integration of new technologies and solutions (e.g., InfraTech) are increasingly embedded in mandates for project preparation support. Moreover, investors increasingly use climate and ESG factors to filter out projects with high, uncompensated risks and to plan for needs like intensive stakeholder consultation. Whereas donors and most MDB/DFI and IO hosted PPFs aim at "sustainability from the start" in early, standardized, comparable and institutionalized ESG approaches, much government practice integrates environmental and social assessments in later feasibility stages or as an after-thought despite efforts to formalize expectations for ESG diligence into policy.

Given the knowledge gap, governments will need consistent advisory presence to raise the bar. Examples that aim to build government capacity to embed sustainability into projects and build local capacity are highlighted in Box 2.5.

BOX 2.5: PROJECT PREPARATION AND FINANCE HIGHLIGHTING SUSTAINABILITY AND CAPACITY BUILDING

The **ADB Southeast Asia Innovation Hub** offers knowledge and capacity-building programs, as well as tools and diagnostics. The Six Champions Program empowers government staff to become sustainability leaders and identify projects. The facility also details capital raised, projects financed and debt capital markets issues.⁹⁶ **The Climate Finance Access Network (CFAN) led by the Rocky Mountain Institute** embeds experienced climate finance advisors with governments in developing economies.⁹⁷ Other recent approaches include frameworks, tools and consultations, including the **Systemic Risk Assessment Tool** launched by the private sector-led Coalition for Climate Resilient Investment (CCRI).⁹⁸

Source: ADB, CFAN, CCRI.

96 ADB (Inter-American Development Bank). 2022. Southeast Asia Innovation Hub. March 2022. <https://www.adb.org/sites/default/files/publication/698271/adb-southeast-asia-innovation-hub-green-finance.pdf>

97 Climate Finance Access Network. <https://cfanadvisors.org/>.

98 Coalition for Climate Resilient Investment. <https://resilientinvestment.org/>.

Although sustainability is often assigned a lower order of importance in times of economic stress, the current conflation of crises also calls for complementing robust governance with a wide lens on sustainable infrastructure. The adoption and incorporation of the QII Principles into project design and preparation ensures the duopoly of governance and sustainability are comprehensively addressed in infrastructure investments. Efforts such as the World Bank and Government of Japan established QII Partnership helps to address this by providing grants to systematically promote the application of the QII Principles in infrastructure development in EMDEs.⁹⁹

As an example, one interviewee called for sustainability and technology to conserve capital and find efficiencies such as through smart contracting. The tradeoffs, however, may be stark and political. For example, mechanized approaches to building greenfield projects may reduce life-cycle costs and improve efficiency, but COVID-19 impacts on labor (unemployment) and high inflation may tip the scale to brownfield options that create more jobs.¹⁰⁰

Extreme climate crises, as in Cape Town's "Day Zero" water crisis from 2016 to 2018, spot-light the interconnections between governance, sustainability, and resilience in water infrastructure. Collaboration challenges at different levels were compounded by lack of planning, poor financial performance, limited data for decision-making and weak

99 World Bank Group (WBG), Government of Japan, Quality Infrastructure Investment Partnership. 2022. <https://thedocs.worldbank.org/en/doc/61714f214ed04bcd6e9623adoe215897-0400012021/related/QII-Brochure-EN-print.pdf>.

100 Hallegatte, Stephane, Jun Rentschler, Julie Rozenberg, Clive Harris, Jyoti Bisbey, Lori Kerr, James Markland, et al. 2021. *Well Maintained: Economic Benefits from More Reliable and Resilient Infrastructure*. GIF (Global Infrastructure Facility). [https://www.globalinfrastructure.org/sites/gif/files/2021-07/Well%20Maintained Economic%20Benefits WB G20 Report .pdf](https://www.globalinfrastructure.org/sites/gif/files/2021-07/Well%20Maintained%20Economic%20Benefits%20WB%20G20%20Report.pdf)

stakeholder consultation.¹⁰¹ Good governance of sustainability also means improving evaluation, monitoring and management of impacts.¹⁰²

Certain impacts are difficult to measure without sophisticated data tools, such as restorative nature interventions. Such measurement, monitoring and management may be best accomplished by sustainability leads, stand-alone committees and organizational champions. At the same time, governments should be conscious that good governance in the preparation of infrastructure projects also involves addressing emerging concerns with data privacy and cybersecurity. Regardless of approach, climate and ESG analysis and reporting can be a useful signal to funders and investors, but must start with manageable, replicable behaviors that can be institutionalized.

ACTION AREA 2.5

Continued efforts and support will be needed for the adoption and integration of sustainability and governance considerations, including the QII Principles, into project preparation at the early stage of project development.



101 Fell, Jessica, and Kristy Carden. 2022. "Lessons from the Cape Town Water Crisis and the Need for a Renewed Technical Agenda." Brookings Institution, March 30, 2022, <https://www.brookings.edu/blog/africa-in-focus/2022/03/30/lessons-from-the-cape-town-water-crisis-and-the-need-for-a-renewed-technical-agenda/>.

102 Concerns are raised about limited accountability to achieving sustainability goals, reporting at the project level with limited monitoring, and ex-ante reporting of emissions reductions but not those realized ex post in: EBRD. 2021. *Cluster Evaluation: Sustainable Infrastructure Operations in Advanced Transition Countries*. London: EBRD (European Bank for Reconstruction and Development). <https://www.ebrd.com/sites/Satellite?c=Content&cid=1395304761281&pagename=EBRD%2FContent%2FDownloadDocument>.

CHAPTER 3

Scaling-Up Private Capital Mobilization (PCM)

3.1 The State of PCM in Sustainable Infrastructure

According to the GIH, in 2020, 75 percent of private investment transactions in MICs and LICs needed co-financing from non-private institutions, most commonly development banks.¹⁰³ This, coupled with the decrease of the last few years in new private investment in infrastructure as noted in the Introduction of the stocktake, suggests a need for MDBs to ramp up efforts to redirect a portion of the \$6.5 trillion in assets under management by private investors¹⁰⁴ to EMDE infrastructure. However, as noted in the rest of this chapter, the responsibility to catalyze these investments does not lie solely with MDBs. The donor community, G20 members, EMDE governments, and investors themselves must collaborate with MDBs/DFIs to help fund, regulate, and design the instruments and platforms with the highest potential for leveraging scarce development finance and concessional resources, and that can be efficiently scaled and replicated for sustainable impact.

In 2015, MDBs reaffirmed their pledge to catalyze more investment from the private sector and other sources of capital to achieve the SDGs by “leveraging their own capital base and borrowing from capital markets to increase their own ability to finance development.”¹⁰⁵ MDBs committed to a revised financing framework that would catalyze more public and private financial flows and took steps to operationalize it.¹⁰⁶

103 McKinsey. 2022. “McKinsey’s Private Markets Annual Review.” McKinsey, March 24, 2022. <https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/mckinseys-private-markets-annual-review>.

104 Ibid.

105 ADB (Asian Development Bank). 2017. *Mobilization of Private Finance by Multilateral Development Banks*, 2016 Joint Report. ADB. <https://www.adb.org/documents/mobilization-private-finance-mdbs-dfis-2016>.

106 Through the “Principles of MDBs Strategy for Crowding-in Private Sector Finance for Growth and Sustainable Development” (or the “Hamburg Principles”) and the “Joint MDB Statement of Ambitions for Crowding in Private Finance.”



To measure progress on this agenda, MDBs adopted a common official definition of PCM, on which they have reported to their shareholders on an annual basis starting in 2016 (Box 3.1).¹⁰⁷

The latest *Joint Report on Mobilization of Private Finance by Multilateral Development Banks and Development Finance Institutions 2019*¹⁰⁸ indicates that total private long-term finance mobilized by MDBs in LICs and MICs was \$63.6 billion, an 8.5 percent decrease from 2018. In geographic terms, \$18.4 billion went to Asia; \$14.6 billion to Latin America and the Caribbean; \$14.4 billion to Africa; and \$6.9 billion to the Middle East. Of this total, the amount of PCM for the infrastructure sector specifically was \$29 billion, a 12 percent decrease from 2018,¹⁰⁹ which when compared to the hundreds of billions of dollars required in such geographies to close the infrastructure gap, seems quite low.¹¹⁰

BOX 3.1: PCM DEFINITION

MDBs together coined the term **PCM** to refer to co-financing by a private entity—through direct and indirect means—of a WB/MDB operation. To be considered a PCM, financing must be:

- On commercial terms due to the active and direct involvement of an MDB (private direct mobilization, or PDM), where all private finance mobilized is attributed to the MDB that set up the deal with no attribution to other co-financiers; or
- In connection with a specific project or activity for which an MDB is providing financing and where no MDB is playing an active or direct role that leads to the commitment of the private entity's finance (private indirect mobilization, or PIM), whereas the total private co-financing is reported pro-rata by the MDBs without including other public development financiers.

The OECD follows a different methodology. The information is collected annually on private finance mobilized, through official development finance interventions, and includes the leveraging instrument used, the amounts mobilized, and the origin of the funds mobilized. Under the OECD reporting methodology, private sector mobilization is calculated as follows:

- 50 percent of private finance mobilized is attributed to the MDB/DFI that led the transaction;
- The remaining 50 percent is attributed to all public development financiers in the transaction on a pro-rata basis, regardless of their level of involvement in the transaction or their involvement in securing the private entity's commitment in the transaction.

Source: World Bank Group, OECD.

107 For details on the MDBs' approach to measuring PCM see: *MDB Methodology for Private Investment Mobilization: Reference Guide*. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/813091529416636675/mdb-methodology-for-private-investment-mobilization-reference-guide>.

108 MDB Task Force on Mobilization. 2021. *Mobilization of Private Finance 2019*. World Bank. <https://openknowledge.worldbank.org/handle/10986/35616>.

109 MDB Task Force on Mobilization. 2019. *Mobilization of Private Finance 2018*. World Bank. <https://openknowledge.worldbank.org/handle/10986/33372>.

110 GIH (Global Infrastructure Hub). 2021. "Infrastructure Monitor 2020." <https://www.gihub.org/infrastructure-monitor/>.

3.2 Local Infrastructure Markets

3.2.1 Local banks and other market players

Certain MICs—such as Colombia, Brazil, Mexico, Thailand, and India—have become a focus of sustainable infrastructure investment by both global and local private investors. In banking, project finance league tables illustrate a dominant group of global banks that have become recurring participants in these markets.¹¹¹ There are also notable examples of domestic banking participation, such as Bancolombia in Colombia,¹¹² both independently or through collaborations with a global lender on a syndicated or a purchased participation basis. Beyond the banking sector, these markets have also witnessed the development of flourishing ecosystems of developers, leasing companies, insurers, equipment manufacturers, consultants and other players in the sustainable infrastructure space.

The collaboration between domestic and international players in these markets has resulted in knowledge sharing and demonstration effects that have led to an increase in the adoption of sustainability and ESG standards, practices and reporting, and improved domestic financial institutions' capacity. Some banks, such as Banco Bradesco¹¹³ in Brazil and YES Bank in India,¹¹⁴ are even developing their own climate finance business lines and reporting on their financed emissions.¹¹⁵ Some of this interest and capacity in the space has also been fostered by targeted MDB initiatives such as EBRD's new Green Economy Financing Facility,¹¹⁶ which supports local financial institutions to invest in energy efficiency with skills building and knowledge transfer, and the IFC Green Banking Academy, which supports Latin American and Caribbean banks with specialized advice and training to accelerate their green transformation.¹¹⁷ These encouraging examples aside, in most EMDEs' local commercial banks lack the experience, expertise and balance sheets to provide the services and lending needed to fully address the sustainable infrastructure gap.

ACTION AREA 3.2.1

Private sector arms of MDBs/ DFIs should continue to increase the amount and share of their portfolio dedicated to lending and equity investments in creditworthy local sponsors and financial institutions, which can set the bar for sustainable ESG practices for other local market participants (suppliers, contractors, services, etc.) through competition and demonstration effects. These investments should be complemented with capacity building initiatives to promote the standardization of structures, standards, and best practices across the local infrastructure sector added to the strengthening of capital market regulatory and financial frameworks.

111 Refinitiv. 2020. "Global Project Finance Review." <https://thesource.refinitiv.com/TheSource/getfile/download/b75a2ed9-d685-492c-b3d4-c24a5cf5d4f3>.

112 Bancolombia has raised award-winning green bonds to finance green construction, water and basic services and energy efficiency. Environmental Finance. 2020. "Sustainability Bond of the Year—Bank—Bancolombia." Environmental Finance, March 30, 2020. <https://www.environmental-finance.com/content/awards/green-social-and-sustainability-bond-awards-2020/winners/sustainability-bond-of-the-year-bank-bancolombia.html>.

113 Banco Bradesco. 2022. "Sustainable Businesses." Banco Bradesco, accessed August 12, 2022. <https://banco.bradesco/html/classic/sobre/sustentabilidade/en/internas/sustainable-businesses.shtm>.

114 Yes Bank. 2022. "Sustainable Finance." Yes Bank, accessed August 12, 2022. <https://www.yesbank.in/about-us/sustainability-at-yes-bank/sustainable-finance>.

115 Partnership for Carbon Accounting Financials. 2022. "Financial institutions taking action." Partnership for Carbon Accounting Financials, accessed August 12, 2022. <https://carbonaccountingfinancials.com/financial-institutions-taking-action>.

116 EBRD (European Bank for Reconstruction and Development). 2022. Green Economy Financing Facilities. Accessed August 12, 2022. <https://ebrdgeff.com/about-seff/>.

117 IFC. 2022. "IFC Green Banking Academy (IFC-GBAC)." IFC, accessed August 12, 2022. https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/financial%20institutions/priorities/climate_finance_sa/gba.

3.2.2 National Development Banks (NDBs)

As noted in the 2021 Global Review of Institutional Investor Mobilization for Sustainable Infrastructure,¹¹⁸ DFIs/NDBs can make important contributions to the infrastructure market based on their knowledge of local conditions, flexibility for supporting financial innovations, and ability to lend long-term in local currency. NDBs can also help develop local bank capacity and raise the standards of the local market through a demonstration effect and by providing technical assistance. NDBs can act as a single market entry point and as an incubator for new market and business creation.

However, several conditions must be in place to fully maximize the catalytic impact of NDBs and avoid market distortions. First, they should have access to low-cost, long-term funding from their central governments and other shareholders, complemented by concessional sources. At the same time, their governance must be independent from their central government to avoid politically driven mandates. Their policies and practices should be driven by the goal of developing a sustainable infrastructure market by mobilizing investors rather than crowding out the private sector by offering subsidized products that cannot be commercially matched by local or international competitors. Finally, they should prioritize developing internal capabilities to tackle each phase of a project, from structuring and feasibility, to providing credit enhancement solutions and co-lending with MDBs and private sector investors. Several of these conditions can be advanced by incorporating MDBs and private shareholders that instill discipline and demand best practices in governance and other standards (e.g., Financiera de Desarrollo Nacional [FDN] in Colombia includes IFC, Development Bank of Latin America (CAF), and Sumitomo Mitsui Banking Corporation (SMBC) among its shareholders,¹¹⁹ and the National Investment and Infrastructure Fund [NIIIFL] in India has major global investors participating in its funds; see Box 3.2).

In addition to investing equity in NDBs, MDBs can help strengthen NDBs to maximize their impact on PCM in several ways. Private arms of MDBs can implement on-lending programs to increase availability of affordable, long-term local currency financing. They can also collaborate and share knowledge in the development and deployment of financial products that target the gaps and investors specific to the local market. Public sector MDBs can focus on providing technical assistance for the development of project finance skills and adoption of ESG and sustainability goals and standards, and supporting the development of risk-sharing facilities for NDBs.

¹¹⁸ Working draft not yet made public.

¹¹⁹ FDN. 2022. "FDN—Entity Information." FDN, accessed August 12, 2022. <https://fdn.com.co/en/the-fdn/corporate-governance/Shareholder-structure>.

BOX 3.2: NDBS CAN PLAY A PIVOTAL ROLE IN MOBILIZING LOCAL AND INTERNATIONAL CAPITAL

Financiera de Desarrollo Nacional (FDN) in Colombia, as a key player in the 4G toll road program (more than \$20 billion in total investments), developed a liquidity multipurpose facility complementary to the traditional project financing in Colombian pesos and US dollar loans, which enabled the mobilization of domestic and international lenders and investors by mitigating specific concession contract and project risks.¹²⁰

India's National Investment and Infrastructure Fund (NIIFL), involving international and domestic institutional investors and managers, has made pioneer equity investments in non-bank financial entities focused on infrastructure (such as Aseem Infrastructure Finance, NIIF IFL, Ayana and Ather Energy).¹²¹

SDG Indonesia One is expected to on-lend ADB and government funds to PT Sarana Multi Infrastruktur (PT SMI) to finance projects with cross-cutting green and sustainable development themes, to de-risk projects and attempt to catalyze a pipeline of commercial SDG funds.

Sources: FDN, NIIF, PT SMI.

120 Del Valle, Clemente Del. 2016. "The Role of FDN as a Specialized and Innovative Development Bank." FDN (presentation), 2016. https://g24.org/wp-content/uploads/2016/11/FDN_The-role-of-FDN-as-a-specialized-and-innovative-development-bank.pdf.

121 NIIF. 2022. "National Investment & Infrastructure Fund." NIIF India (media release), accessed August 12, 2022. https://www.niifindia.in/media_releases.

ACTION AREA 3.2.2

Additional support to NDBs is needed to redefine and amplify NDBs' role in sustainable infrastructure project development and financing, with a focus on mobilizing the private sector in local markets.

3.2.3 Local Currency Financing

The continuing relative scarcity of affordable, long-term local currency financing, coupled with insufficiently developed foreign exchange markets to permit proper hedging, remain as one of the most significant obstacles to attracting more private investment—both domestic and global—into the space.¹²² DFIs and donors have made efforts to address this market gap, one of the most relevant being the establishment of TCX, a currency exchange fund that offers swaps and forward contracts in a multitude of currencies (63 to date¹²³).

122 OECD (Organisation for Economic Co-operation and Development), EDFI, Convergence, and TCX. 2017. *The Need to Reduce FX Risk in Development Countries by Scaling Blended Finance Solutions*. European Commission, B20 report, 2017.

123 TCX. 2022. "About the fund." TCX, accessed August 12, 2022. <https://www.tcxfund.com/about-the-fund/>.

MDBs have also been increasing their local currency offerings by implementing on-lending programs for local banks and NDBs as mentioned below (Box 3.3), using derivative products available in the market, and developing local treasuries to have available funding for multiple operations. The latter solution, as attractive as it often sounds to private investors seeking greater action from MDBs, is unfortunately not particularly effective or scalable due to the complexity of its implementation: the processes are time consuming, often face local regulatory constraints, and funds lie idle while the financing materializes. Other instruments, such as unfunded risk participations, seek to mobilize international investors in transactions where MDBs or NDBs are sourcing the local funding and syndicating/transferring the risk to third parties that only have access to hard currencies. Although some international investors are ready to assume a degree of foreign exchange (FX) risk, this is still very limited and difficult to scale without complementary hedging solutions.

BOX 3.3: MDB ON-LENDING FOR NDBS TO MAKE AVAILABLE LOCAL CURRENCY

In 2019, IDB Invest led a group of local and international lenders to finance the Autopista al Mar 1 highway project in Colombia, in both local currency and US dollars. The participation of IDB Invest was crucial during the structuring process of the financing, and fundamental to complete the long-term debt in local currency, by on-lending Col\$443 billion (approximately US\$143 million) for the construction of the toll road, with the participation of FDN, Colombia's development bank.¹²⁴

Source: IDB.

¹²⁴ IDB (Inter-American Development Bank). 2019. "IDB Invest finances the Mar 1 highway in Colombia to improve the country's road connectivity." IDB (news release), March 20, 2019. <https://www.idbinvest.org/en/news-media/idb-invest-finances-mar-1-highway-colombia-improve-countrys-road-connectivity>.

ACTION AREA 3.2.3

No single solution has proven to be a silver bullet to address the scarcity of local currency financing. As such, continued collaboration is encouraged among MDBs, donors, and investors to develop new tools, while increasing resources for those that have shown relative success, such as on-lending programs in local banks and NDBs, local currency treasuries, risk-sharing facilities, and currency hedging platforms.

3.3 Blended Finance

Blended finance refers to donors (public or philanthropic investors) providing funds or financial instruments to a commercial project, company, or fund at below-market terms. These interventions fall into three broad categories: i) capital investments to improve the credit profile or add loss protection to the benefit of senior investors; ii) guarantees or insurance instruments to enhance the credit profile or mitigate specific risks; and iii) grants for project design and capacity building to improve feasibility, timeliness and bankability. Blended finance can be applied to equity investments in companies and projects, debt instruments (loans and bonds) for projects and companies, and capital investments in funds, which are the most common blended structure, comprising 35 percent of all transactions in 2020.¹²⁵

Blended finance structures—when applied to well-designed projects and especially when coupled with sector reforms—can be effective in mobilizing private investors into markets and asset classes where they normally would not have invested (Box 3.4). Blended finance has mobilized approximately \$170 billion in capital towards sustainable development in developing countries to date. Economic infrastructure has been the most frequently targeted sector in blended finance transactions (39 percent of blended finance transactions by target countries), and energy in specific (27 percent), followed by financial services.¹²⁶

However, blended finance volumes have failed to reach a scale to make a significant dent in PCM and closing the infrastructure financing gap. The vast majority of official development assistance (ODA) continues to be in the form of traditional aid: in 2021, \$1.3 billion of ODA was reported as private sector instruments (PSI), representing less than 1 percent of total ODA. Moreover, concessional capital commitments provided by DFIs to blended finance transactions have remained constant over the past five years, averaging \$1.6 billion per year.¹²⁷ Not only are blended finance volumes low, but most blended finance participants have only taken part, to date, in a single deal.¹²⁸

One of the main challenges in scaling and replicating blended finance transactions, particularly in the infrastructure sector, is the significant level of resources and time needed to structure and execute a blended finance instrument. These structures require a high degree of coordination and negotiation within and between multiple parties: donors (often multiple), the DFI(s) acting as intermediaries, and private investors. Donors and DFIs typically must contend with complex and drawn-out approval processes. Investors, particularly institutional investors, have varying return, credit rating, and concentration requirements that must be reconciled. This complexity is coupled with the already complicated and lengthy process of executing the infrastructure project that is the ultimate beneficiary of the blended investment.

Lack of coordination among the promoters of blended finance also hampers efforts to achieve scale. At any given time, there are often multiple efforts led by different DFIs with similar structures competing for the same limited pipeline of projects, investors, and donors, either due to a lack of communication or a lack of incentives to collaborate and share the recognition for a successful transaction. This is not only highly inefficient but also reduces the chances of success of any given effort as participants lose

125 Convergence. 2021. “The State of Blended Finance 2021.” Convergence, October 2021. <https://www.convergence.finance/resource/obbf487e-d76d-4e84-ba9e-bd6d8cf75ea0/view>.

126 Convergence. 2022. “Blended Finance.” Convergence, accessed August 12, 2022. <https://www.convergence.finance/blended-finance>.

127 Convergence. 2021. “The State of Blended Finance 2021.” Convergence, October 2021.

128 Ibid.

confidence in their initiative's ability to rise above the rest in the race to secure donors, investors and projects. Finally, there is reticence to share information on transaction details, results, and lessons learned, meaning that each subsequent effort must “reinvent the wheel.”

Moreover, the successful execution of a blended finance structure does not necessarily translate to success in mobilizing private investment in a sustainable manner. Concessional funds or guarantees are used in a commercial transaction to attract private investors that normally would not have invested in a particular asset class and/or market because of its risk-return profile, based on the hypothesis that once the investors get comfortable with this risk-return profile, they will continue to invest in the asset class or market without concessional finance. However, poorly structured blended finance efforts can fall prey to one or more pitfalls: i) inflating returns for investors that would have invested without concessional financing; ii) crowding out investors that would have provided financing without concessional financing; or iii) losing investors unable or unwilling to continue investing in the asset class or market without the concessional financing. To avoid these pitfalls, there must be greater knowledge sharing and transparency on deal structures and performance to apply lessons learned.

BOX 3.4: EXAMPLES OF BLENDED FINANCE

In 2020, the World Bank Group, Abu Dhabi Future Energy Company PJSC, ADB and the Government of Uzbekistan signed loan and guarantee agreements to finance the first 100 megawatt (MW) solar photovoltaic power plant in the country. The project is a successful demonstration of opening a specific market and bringing interest both from the government and the private sector, by applying blended finance structures. Today, Uzbekistan has seized the momentum of the project, and there are about 7,000 MW of solar and wind projects under development.¹²⁹

Source: World Bank Group.

129 IFC (International Finance Corporation). 2022. “Pioneering Solar Power Plant to Take off in Uzbekistan with World Bank Group Support.” IFC (press release), December 22, 2022. <https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=26143#:~:text=Scaling%20Solar%20is%20a%20World,%2C%20insurance%20products%2C%20and%20guarantees.>

ACTION AREA 3.3

Increase funding and structuring of viable blended finance investments. Given fiscal and budgetary constraints, it is important to aim for a balanced blend of liquid grants and guarantee instruments. This increase in blended finance solutions should hinge on collaboration among key stakeholders to ensure that efforts are focused on mobilizing private capital with the least amount of concessional funds and without perpetuating market distortions or heavily subsidizing the private sector. A concerted effort will be needed to share transaction details, results and lessons learned, including granting more access to the Global Emerging Markets (GEMs) database,¹³⁰ to improve the efficacy, scalability and replicability of each subsequent initiative.

130 GEMS. 2022. “Global Emerging Markets Risk Database Consortium.” GEMS, accessed August 12, 2022. <https://www.gemriskdatabase.org/>.

3.4 Mobilization Instruments

3.4.1 Asset Securitization and Pooling

Asset securitization within the context of PCM for EMDE infrastructure refers to the issuance of securities backed by the income stream of a project (project bonds) or portfolio of projects (typically through trusts), or by the debt service flows of a pool of loans (asset pooling). The objective of the sale of the securities is to make available funds for new infrastructure investments in greenfield and brownfield projects while attracting a different pool of private investors to the asset class (e.g., institutional investors as opposed to the traditional commercial banks).

Despite some early optimism about the growth of project bonds for EMDE infrastructure, particularly those labeled as green, there have been few successful issuances due to issues of scale, the absence of sufficiently detailed project information, illiquidity, and lack of appetite to analyze individual deals.¹³¹ Several of these issues that hamper mobilization of new investors inherent to individual project bonds are being addressed by setting up trusts that invest in a portfolio of projects with specific investment criteria related to credit rating and sector or geographic concentration.

Some of these trusts include both greenfield and brownfield assets, such as the Infrastructure Investment Trusts (InvIT) recently launched in India, whereas others focus purely on operational assets. The former target a mix of investor types whereas the latter target institutional investors that shy away from project development and construction risk and prefer not to commit funds while waiting for projects to reach commercial completion. There are also platforms that match different investors to different stages in a project's life cycle, such as Climate Fund Managers' Climate Investor One (Box 3.7).

Another form of securitization to mobilize funds from institutional investors that is gaining momentum is asset pooling, which refers to the acquisition of a portfolio of loans by a vehicle that issues collateralized loan obligations or variable funding notes in the case of warehousing.¹³² The objective of this structure is to free up the loan originators' balance sheets so that they can provide financing for new projects, as discussed further in section 3.4.3 Asset Recycling. Interviews conducted during the stocktaking exercise suggest a strong interest for asset pooling structures sourced from DFIs' loan portfolios, given their well-regarded structuring and diligence standards. One of the challenges of this approach is to arrive at a model that provides an acceptable return to both originators and investors given the diversity of pricing models employed by DFIs. Another hurdle that must be overcome is the "standardization" of policies among originators, which is a key element if there are expectations of merging assets, provided by multiple entities, under instruments that are commercially attractive to market investors.

¹³¹ Stocktake interviews.

¹³² Securitized warehouse funding is funding provided by one or a small number of lenders on a limited recourse basis to a special purpose vehicle (SPV) and secured on a portfolio of assets acquired by the SPV from the originator. The funding may take the form of a loan or a variable funding note (VFN). Clifford Chance. 2016. "Securitized Origination Warehouse Financing—a flexible funding tool." Clifford Chance Briefing Note, November 2016.

BOX 3.5: EXAMPLES OF ASSET SECURITIZATION AND POOLING

Project bond: Turkey's Elazig Hospital project resulted in the country's first greenfield project bond. It was a collaborative effort by the EBRD, IFC, Multilateral Investment Guarantee Agency (MIGA) and other bilateral DFIs, as well as credit enhancements that raised the credit rating above the sovereign ceiling.¹³³

Trust: As an example, AIMCO, one of Canada's largest pension funds, led a consortium of investors to allocate to India's first InvIT, led by Kohlberg Kravis Roberts & Co. (KKR), because of its operating, stabilized, cash-flow generating assets and the high credit rating on its loans. This vehicle did not require catalytic capital because of the strength of the manager and the assets.¹³⁴

Asset pooling: Bayfront Infrastructure, managed by Clifford Capital, acquired loan participations in Asia and Middle East infrastructure from commercial banks structured into collateralized loan obligations (CLO) with blended finance components and strong official sponsorship, providing an early example of warehousing EMDE infrastructure loans for securitization.¹³⁵

Sources: EBRD, MIGA, Bayfront Infrastructure.

133 Jordan-Tank, Matthew, and Vamsee Kanci. 2017. "Success factors in Turkey's Elazig healthcare PPP." World Bank Blogs, April 19, 2017. <https://blogs.worldbank.org/ppps/success-factors-turkey-s-elazi-healthcare-ppp>.

134 Business Wire. 2021. "KKR-Sponsored Virescent Infrastructure Raises INR4.6 bn in India's First Renewable Energy InvIT from AIMCo and other investors." Business Wire, September 28, 2021. <https://www.businesswire.com/news/home/20210928006194/en/KKR-Sponsored-Virescent-Infrastructure-Raises-INR4.6-bn-in-India%E2%80%99s-First-Renewable-Energy-InvIT-from-AIMCo-and-other-investors>.

135 Interviews; and Bayfront Infrastructure. 2022. "Mobilising Institutional Capital through IABS." Bayfront Infrastructure, accessed August 12, 2022. <https://www.bayfront.sg/platforms>.

3.4.2 Asset/Capital Recycling

Asset/capital recycling as a tool to mobilize private capital for new EMDE infrastructure projects has two main applications: by public entities to monetize revenue-generating public assets and by financial institutions to free up capital on their balance sheet to support new projects. In the first case, public entities transfer either the ownership, operation rights, or rights over an income stream of an operational asset (e.g., a toll road) to a private investor in exchange for an upfront payment that is used to fund new infrastructure investments. This can be done through multiple structures, including a sale, concession, lease or securitization, with a variety of investors based on the structure ranging from concessionaires to institutional investors.¹³⁶ Depending on the structure, in addition to generating funds for new investments for the public entity, asset recycling can allow for long-term risk transfer and can result in gains from private sector efficiencies in asset management. These benefits can only

136 Sundararajan, Satheesh. 2021. "Asset recycling in EMDE infrastructure development can be a win-win-win." World Bank, August 4, 2021. <https://blogs.worldbank.org/ppps/asset-recycling-emde-infrastructure-development-can-be-win-win-win#:~:text=What%20is%20asset%20recycling%3F,and%20For%20new%20infrastructure%20assets>.

be fully realized if the transfer of rights is structured according to PPP best practices, and if funds are committed to new, specified investments, and are managed transparently.¹³⁷

In the application by financial institutions, these entities sell participations in loans or an entire book of loans, either directly to other financial institutions or through asset pooling as discussed in section 3.4.1. This frees up capital for them to deploy to new infrastructure projects. The benefits of these initiatives are maximized when this freed-up capital is used strategically and efficiently to mobilize other private investments as discussed throughout this chapter. Moreover, the success of this approach depends on market conditions and pricing models. Under current market conditions, returns from infrastructure projects in EMDEs may be less competitive vis-à-vis other alternatives, which makes it difficult for MDB or commercial lenders to sell their positions to long-term investors.

¹³⁷ Castalia. 2021. *Government Asset Recycling: Unlocking private capital to deliver more infrastructure; Report on Asset Recycling Market Assessment in East Asia for the World Bank*. World Bank.

BOX 3.6: EXAMPLES OF ASSET/CAPITAL RECYCLING

The **National Highways Authority of India** adopted a sector-specific approach (the Toll-Operate-Transfer program) to monetize brownfield highway assets by offering a 30-year lease to private operators in exchange for an upfront fee deposited into a central trust that can be deployed to the highway sector.¹³⁸

Mexico's **FONADIN** succeeded in two securitizations of income from the existing Puebla toll road, totaling Mex\$15 billion and Mex\$6 billion each, to reinvest in building new infrastructure and modernizing existing toll concessions.¹³⁹

In **Room2Run**, the African Development Bank transferred the mezzanine credit risk of a book of loans— through a synthetic credit securitization with a mezzanine credit guarantee—to Africa 50, a project development and finance facility, and the Mariner Group, a structured finance investor.¹⁴⁰

Sources: Castalia, World Bank, Credit Agricole, Africa50 (AfDB).

¹³⁸ Ibid.

¹³⁹ Reino, Juan Luis Gómez, et al. 2021. "Experiencia Internacional en el reciclaje de activos de infraestructura pública: estudios de caso impactos y lecciones aprendidas." IDB (Inter-American Development Bank), June 2021. <https://publications.iadb.org/publications/spanish/document/Experiencia-internacional-en-el-reciclaje-de-activos-de-infraestructura-publica-estudios-de-caso-impactos-y-lecciones-aprendidas.pdf>.

¹⁴⁰ Africa50. 2018. "Africa50 invests in landmark Room2Run US\$1 billion securitization transaction." Africa50 (news release), September 18, 2018. <https://www.africa50.com/news-insights/news/africa50-invests-in-landmark-room2run-us-1-billion-securitization-transaction-240/>.

3.4.3 Investment Funds and Platforms

There have been some notable examples of infrastructure investment funds, with and without DFI support or concessional funding, as shown in Box 3.7. However, given the current EMDE infrastructure financing needs, DFIs are being called on by the institutional investor community to increase their support to infrastructure investment funds and platforms in the form of anchor capital contributions, subordinated capital contributions, first loss guarantees (channeling donor funds in blended finance structures), and access to their project pipeline such as under IFC's Managed Co-Lending Portfolio Program (MCP) (Box 3.7).

One of the challenges to achieving this is to align the interests of all the parties involved in these efforts. Due to institutional or regulatory requirements, institutional investors seek a well-rated (typically investment grade or above), well-diversified portfolio with low concentrations by geography, sector, or individual projects. However, DFIs and donors must often respond to mandates for targeted efforts to mobilize funds specifically for the infrastructure sector in EMDEs with a focus on the most underserved markets. Infrastructure is inherently a high capital consumption industry where the financing needs of even one single project can easily surpass investor concentration limit criteria and skew the rating of the entire portfolio. In some cases, the use of concessional capital for credit enhancement is an inefficient solution given the size of the guarantee needed. And even if a fund is targeted to high yield investors with more lenient criteria, depending on market conditions where assets in developed economies are yielding comparable if not superior returns, an EMDE fund may not be an attractive choice for these investors.

An interesting alternative to some of the challenges described above is the development of local funds, focused on mobilizing domestic investors. This approach addresses the FX issue associated with currency mismatch, integrates local knowledge, and usually offers a pricing range aligned with market expectations. Although there is need for a minimum level of regulatory stability and market capacity for these vehicles to be developed at a reasonable scale, which means that they are not applicable in every geography, there are numerous examples of local and international players successfully deploying domestic funds and efficiently working alongside MDBs and commercial banks in major infrastructure initiatives.

BOX 3.7: RECENT EXAMPLES OF INVESTMENT PLATFORMS

Climate Fund Managers' Climate Investor One,¹⁴¹ co-funded by the EU, integrates MDBs/DFIs, commercial finance and institutional investors. It focuses on distributing participations via standardized funds matching different investors to the different stages in a project's life cycle based on their risk preferences. The initiative leverages donor and DFI funds to mobilize commercial finance during the early stages of projects (i.e., development and construction) and institutional investors' capital in the later stages (operations).

BlackRock's Climate Finance Partnership, which announced its financial close at COP26, raised \$673 million to invest in climate focused projects in emerging markets. The multi-asset platform leverages the support of key concessional funding providers, such as the Agence Française de Développement (AFD), KfW and the Japan Bank for International Cooperation (JBIC), plus two philanthropic institutions.¹⁴²

The **IFC's MCPP program** uses blind pools of loan participations benefitting from a portfolio credit enhancement, leveraging IFC diligence and management to yield a vehicle that meets institutional investor requirements.¹⁴³

Sources: Climate Fund Managers, BlackRock, IFC.

¹⁴¹ Climate Fund Managers. 2022. "Climate Investor One." Climate Fund Managers, accessed August 12, 2022. <https://climatefundmanagers.com/funds/#CIO>.

¹⁴² Blackrock. 2022. "Climate Finance Partnership." Blackrock, accessed August 12, 2022. <https://www.blackrock.com/institutions/en-us/strategies/alternatives/real-assets/infrastructure/climate-finance-partnership>.

¹⁴³ IFC (International Finance Corporation). 2018. "MCPP Infrastructure an Innovative Structure to Mobilize Institutional Investment in Emerging Market Infrastructure Loans." IFC. <https://www.ifc.org/wps/wcm/connect/4c9e0868-1232-4212-b4f2-a5c39d177afa/MCPP+Infrastructure+Flyer+2018.pdf?MOD=AJPERES&CVID=mcoa4bt>.

ACTION AREA 3.4

There is a strong need for additional project preparation resources to expand the pipeline of investment ready infrastructure projects and portfolios, as many mobilization instruments and platforms are constrained in terms of scale and deployment of funds by limited pipelines meeting their investment criteria.

3.5 MDBs' Role

Calls for greater action regarding the mobilization of private capital in EMDEs are usually addressed at MDBs without distinguishing between the public sector and private sector focused MDBs (or units of MDBs), and often don't mention the differing realities of mobilizing capital in MICs and LICs. These explorations also often disregard the fact that MDB balance sheets have limited capacity to absorb risk considering that they must maintain a minimum rating in order to raise low-cost capital to provide affordable financing to their beneficiary shareholders.

In fact, efforts by MDBs to mobilize capital must be carefully designed considering the nature of their mandate (public versus private), comparative advantages versus value-add, and how their limited capital is optimized while addressing the specific needs of each EMDE market. Specifically, in LICs and other countries where there is very limited institutional capacity and very shallow financial markets, public sector MDBs should focus on upstream and midstream activities developing the enabling conditions (e.g., institutional capacity, bankable project pipeline) necessary for private sector investment and supporting EMDE governments with project development and preparation to expand pipelines of investment ready projects with PCM potential. Downstream interventions by private sector MDBs in these countries should ideally be done within the context of an upstream MDB program to maximize the probabilities of success and foster investor confidence in the market.

Conversely, in more robust markets where there is an established banking sector, sufficient capacity at the government/SOE level, and satisfactory regulatory frameworks, the private sector and MDBs may have a more active role in helping develop domestic infrastructure markets. This should be done not only through strategic equity and debt investments in local players, but also by providing catalytic debt instruments and guarantees addressing residual risks preventing international and local investors from investing in sustainable infrastructure. Currently, guarantees and similar credit enhancement instruments represent only a very small portion of MDBs' portfolios.¹⁴⁴ MDBs can take several measures to fully realize the untapped potential of these instruments to mobilize private capital, including by increasing reinsurance and collaboration between providers for improved pricing; working with regulators to adapt relevant regulations; and raising investor awareness of products and benefits.¹⁴⁵ However, it is imperative that guarantees are preceded by engagements in specific sectors to effect necessary sector reforms and improve enabling environments for PPI, which serve as critical de-risking measures prior to the provision of guarantees.

Of course, as discussed throughout this chapter, MDBs are not solely responsible for nor able to mobilize the massive amounts of private capital needed to address the EMDE infrastructure gap. Not only are more resources—both funds and manpower—also required of donor countries, philanthropies, and investors, but there should be greater collaboration among all stakeholders to maximize the impact of each contribution. Additionally, EMDEs governments need to undertake necessary structural reforms to systematically enable PPI. There needs to be greater communication, knowledge sharing, and willingness to share recognition—particularly among MDBs—so that each intervention has a greater potential for success, scalability and replicability. There is a need for an informed discussion on how to best organize this “ecosystem” to follow a systematic approach aimed at optimizing the limited resources available while avoiding inefficient competition, creating single use models or subsidizing investors' positions in the name of mobilization.

¹⁴⁴ G20-IWG Risk SIGMA Workstream (jointly prepared by MDBs). 2018. *MDB Stock-Taking and Taxonomy on Guarantees*.

¹⁴⁵ G20-IFA-WG (International Financial Architecture Working Group). 2020. “G20 Stock-Take: Best Practices of MDBs and Specialized Multilateral Insurers in Political Risk Insurance for Equity Investments, Medium and Long Term Debt Investments and Other Insurance Solutions.” September 2020. <https://iciiec.isdb.org/wp-content/uploads/2020/12/G20-stock-take.pdf>.



CHAPTER 4

Data, Tools, and Standards for Decision-Making and Reporting

4.1 Data, Tools, and Standards on Infrastructure Performance are Critical

In an effort to systematically embed sustainability considerations throughout the infrastructure project life cycle, an array of standards, frameworks, and taxonomies have been developed—with the ultimate goal of providing consistent, predictable guidance for governments, project developers, private investors, and other key stakeholders. Yet, the proliferation of new standards and taxonomies leave stakeholders—including governments, investors, and financial institutions—perplexed as to which to apply, making it all the more necessary to coalesce around a set of global standards that are market-based (much like the Equator Principles). Additionally, as standards become more targeted and granular, the ecosystem has become increasingly complex and challenging to navigate for public and private participants alike.

In order to implement these emerging standards and utilize these tools to make investable infrastructure more sustainable and grow it as an asset class, policy makers, financiers, and investors need better and more readily accessible data on markets, sectors, portfolio performance, and project-level information, including climate change-related data. Furthermore, sustainable finance regulations and standards (e.g., IFC Performance Standards, Equator Principles) have spurred demand, especially from investors, for consistent and comparable sustainability and ESG information. Such data can help identify the climate impact, environmental costs, social impact, and good governance practices to lower life-cycle costs, asset loss, and ultimately aid in the alignment with frameworks such as the G20 QII Principles. Policy makers and investors can also use this data to tackle greenwashing by assessing infrastructure investments against the sustainability objectives that they claim.

ACTION AREA 4.1

Increase support to initiatives that promote a global, broadly accepted, and market-based set of standards and taxonomies around sustainability—including both climate and ESG—to tackle greenwashing and better assess infrastructure investments against investors' claimed sustainability objectives.

4.2 Improving Quality and Availability of Infrastructure Performance Data

Market participants (e.g., governments, developers, investors, among others) need data for benchmarking existing assets, and for making asset allocation decisions such as the prioritization of geographic and sector strategies. Investors need information to carry out market, asset, and developer due diligence. With growth in sustainable infrastructure, asset-level financial and operating data—as well as information at higher levels of aggregation (e.g., portfolio level, sector and economy)—are especially needed to mobilize private participation. These data and studies would also support prudent regulation reforms to reclassify infrastructure finance.

In order to meet these needs, a significant amount of work has been done by the G20, MDBs, GIH, and the OECD, particularly within the EMDE market, to improve the quality and quantity of publicly available ESG performance data for infrastructure assets (see Boxes 4.1 and 4.2). Such stakeholders have begun to develop project-level databases and data analytics to collect and synthesize this data with a view toward improving the transparency of EMDE infrastructure (see Chapter 2, Box 2.3 on the World Bank PPI Database and other relevant examples). Beyond improving access to publicly available data sources, more work will need to be done on how data is actually utilized. Improving data governance to ensure that information is standardized and able to be leveraged by different asset class institutions will be crucial.



BOX 4.1: INFRASTRUCTURE FINANCE DATA AND ANALYTICS

The leading commercial providers of infrastructure information offer a wide variety of data and analytics, primarily for investors. **IJGlobal**, **Preqin**, and **Refinitiv** offer asset level information, tracking, entity characteristics and long performance history, unavailable in EMDEs.¹⁴⁶ **EDHEC Inframetrics'** platform delivers asset valuation analytics, portfolio and fund indexes, benchmarks, valuation information and peer groups.¹⁴⁷ **Moody's Data Alliance** is a collaboration with financial institutions including DFIs¹⁴⁸ to develop data and models for private credit risk; data contributors can leverage credit risk benchmarking analytics while maintaining the confidentiality of underlying asset- and fund-level data.¹⁴⁹ Although all the commercial databases contain some information about EMDE infrastructure deals, the lack of granular EMDE information shifts responsibility to MDBs and IOs to develop decision-useful information for private market participants.

Sources: *Moody's Analytics, IJGlobal, Preqin, EDHEC.*

146 IJGlobal. 2020. Infrastructure Journal and Project Finance Magazine Database. <https://www.ijglobal.com/data>.

147 EDHECinfra. 2022. "Investing Transparently in Infrastructure." Inframetrics (blog), 2022. <https://edhec.infrastructure.institute/>.

148 Kelhoffer, Kelvin. 2020. "Moody's Analytics Data Alliance Project Finance Consortium Helps World Bank Group Achieve Its Strategic Objectives." Moody's Analytics, July 2020. <https://www.moodyanalytics.com/articles/2020/data-alliance-world-bank>.

149 Moody's Analytics. 2018. "Data Alliance." Moody's Analytics. <https://www.moodyanalytics.com/product-list/data-alliance>.

Additional difficulties with EMDE infrastructure performance data are related to their degree of detail because most information is primarily available at an aggregated level (Box 4.2). However, rating agency comparisons of EMDE versus developed markets infrastructure data still provide some encouraging insights, including for "green" assets, such as:

- **Global Emerging Markets (GEMs)** anonymized MDB data underlines EMDE infrastructure's comparable or better default rates relative to non-infrastructure financing.¹⁵⁰
- A 2017 study by **Moody's Analytics Data Alliance Project Finance Consortium**¹⁵¹ finds the credit performance of project loans in EMDEs shows "resilient credit performance" and cumulative default risk for project loans in EMDEs of close to investment grade credit quality.
- A **GIH study** of developed markets versus EDME default and loss-given-default rates illustrates that risk in the latter is lower than generally thought and may be comparable with developed markets once assets are in operation.¹⁵²
- **Moody's** finds low 10-year cumulative default rates of 2.9 percent for project finance bank loans, with green uses of proceeds versus 4.7 percent non-green.¹⁵³

150 Arguably, the GEMs data demonstrate the performance impact of MDBs' preferred creditor status. See Jobst, A. 2018. *Credit Risk Dynamics of Infrastructure Investment: Considerations for Financial Regulators*. Washington, DC: World Bank. <https://documents1.worldbank.org/curated/en/606411522326750586/pdf/124720-WP-PUBLIC-Infrastructure-Regulation-Report-WEB.pdf>.

151 Ibid.

152 Risk Control Limited. 2020. *Infrastructure Debt Capital Charges for Insurers*. London: GIH (Global Infrastructure Hub). <https://www.riskcontrollimited.com/wp-content/uploads/2020/11/Infrastructure-Debt-Capital-Charges-for-Insurers-20-125a-04-11-20-v40-1.pdf>.

153 Moody's Investors Service. 2020. "Research: Moody's Sustainable Project Finance Bank Loans Demonstrate Lower Default Risk." Moody's Investors Service. https://www.moody.com/research/Moodys-Sustainable-project-finance-bank-loans-demonstrate-lower-default-risk-PBC_1241719.

Although these highly aggregated global and regional performance data provide an important start, they may not be meaningful enough to inform private capital providers' decision-making. Such decision-making information needs often have to be met through more direct sources, such as on-the-ground presence or strategic partners. Given the varied content and sponsorship of these data platforms, their fragmentation raises the question of use for private sector decision-making. Soliciting feedback on usability from the private sector could help clarify the needs of varied users and opportunities to build on these tools and ensure they create value for their target users.

Another key challenge with these project-level databases is that they rarely identify sustainable infrastructure projects, with the exceptions of those focused on renewable energy. Attributes that are currently not included in these databases include certifications or other labels (e.g., green building certifications) that investors are seeking. As such, MDBs and IOs should work to provide key environmental and social information (e.g., estimated emissions reduced, water and waste management, gender diversity) to support investor efforts in substantiating the sustainability credentials of projects.

ACTION AREA 4.2

Improve the robustness of performance data of proposed and existing infrastructure assets, including those within MDB and IO project databases to enhance and further consolidate existing project-level information for private sector use, and support prudent regulation reforms for institutional investors.

4.3 Data and Tools for the Transition to Climate Resilient Infrastructure

4.3.1 Climate Mitigation: The “Net Zero” Transition

Data on the alignment of climate-sensitive investments with the Paris Climate Accords, NDCs, and country-level climate goals will need to be readily available because this information is important for the advancement of “Net Zero” transition plans. Because most banks active in EMDE infrastructure are signatories to these climate pledges, many have already begun to collect climate data for their lending operations.

Though granular information aligned with the Net Zero transition is still scarce, even in developed markets, corporations and governments are starting to publish data, targets, and policies at the highest levels to clarify plans and pathways to achieve Net Zero (Box 4.2).

BOX 4.2: NET-ZERO REPORTING INITIATIVES FOR INFRASTRUCTURE

A high-level effort called the **Climate Data Steering Committee** was launched in June 2022 to deliver a plan at COP27 for a global open climate data platform to consolidate and standardize open Net Zero transition data based on private sector climate commitments.¹⁵⁴

In addition, the **Glasgow Financial Alliance for Net Zero (GFANZ)** recently issued recommendations and guidance for consultation to deliver a global framework for net zero transition planning across the financial sector, which includes the phase-out of the financing of high-emissions activities. The guidance details needed reporting, data and targets.¹⁵⁵ The **Institutional Investors Group on Climate Change (IIGCC)** has also added guidance for infrastructure asset managers and owners to align assets with the goal of global Net Zero emissions by 2050.¹⁵⁶

Sources: Reuters, GFANZ, IIGCC.

154 Wojazer, Philippe. 2022. "Macron, Bloomberg Seek Better Monitoring of Business Climate Action." Reuters, June 3, 2022. <https://www.reuters.com/business/sustainable-business/macron-bloomberg-seek-better-monitoring-business-climate-action-2022-06-03/>.

155 GFANZ (Glasgow Financial Alliance for Net Zero). 2022. "Recommendations and Guidelines: Financial Institution Net-Zero Transition Plans." GFANZ. https://assets.bbhub.io/company/sites/63/2022/06/GFANZ_Recommendations-and-Guidance-on-Net-zero-Transition-Plans-for-the-Financial-Sector_June2022.pdf.

156 Gillam, Ross . 2022. "Net Zero Guidance for Infrastructure Asset Class Launched by IIGCC." IIGCC (blog), 2022. <https://www.iigcc.org/news/net-zero-guidance-for-infrastructure-asset-class-launched-by-iigcc/>.

For example, data to evaluate progress in cutting greenhouse gas (GHG) emissions by cities currently rely mostly on estimates, although quantitative methods and new data sets are becoming available.¹⁵⁷ Notably, China has introduced real-time monitoring requirements at power plants, which will generate facility-level data for assessing progress toward emissions reductions targets.¹⁵⁸ Common methodologies for reporting on GHG emissions, including financed emissions, are being implemented by many banks and corporations leading in infrastructure finance and development. This data will also be critical for monitoring and verification of emissions for carbon markets. However, it will also be critical to define an established calculation method that is universally adopted to avoid confusion and greenwashing and, as a result, boost transparency.

These initiatives can be expected to cascade through financial institutions and investors in EMDE infrastructure in the coming years. To ensure a coordinated response, EMDE governments and the donor community should prioritize technical training to help developers and operators provide the necessary information.

ACTION AREA 4.3.1

Governments should aim to develop concrete strategies on consistent, comparable data related to climate action goals and Net Zero transition objectives with a universally agreed approach to measuring and calculating emissions.

157 Dasgupta, Susmita, Somik Lall, and David Wheeler. 2022. "Cutting Global Carbon Emissions: Where Do Cities Stand?" World Bank Blogs. <https://blogs.worldbank.org/sustainablecities/cutting-global-carbon-emissions-where-do-cities-stand>.

158 IEI Model. 2019. "CEAP: China Emissions Accounts for Power Plants." IEI Model (blog), February 26, 2019. <https://en.ieimodel.org/apps-integrations/>.

4.3.2 Climate Adaptation: Building Resilience

In addition to the need for Net Zero data collection and reporting methodologies, there is a growing business case for the integration of adaptation, resilience, nature-based and circular economy solutions into infrastructure investments. As noted in the OECD's *Building Resilience: New Strategies for Strengthening Infrastructure Resilience and Maintenance*, infrastructure systems—particularly health, power, water and sanitation, transport, and telecommunications—are particularly vulnerable to being damaged or disrupted as a result of climate change; incorporating resilience at the earliest stages of an infrastructure project is thus crucial in improving overall maintenance and life-cycle efficiencies.¹⁵⁹ However, fulfilling this need has proven challenging thus far. Data are required to quantify the costs and benefits of making long-term capital and operating expenditures for risk management and hazard response.¹⁶⁰ MDBs, specialized climate funds, IOs, and consultants confirm that information challenges complicate the business and social case for action: too many potential processes and outcomes, lack of funding for data collection, the reliance on anecdotal examples, and need for illustrations of impact and costs over long periods.¹⁶¹ Data to enhance the case may include: the cost of insurance; climate and weather projections; granular, local climate risk data; and context- and method-specific costs and benefits of adaptation. This type of data is critical in determining project site selection, design options, and the overall impact on construction and O&M of assets. A key consideration for new project development is how to design the asset taking climate resilience into account, and the degree to which upfront project design that integrates climate resilience has impacts on capital expenditures (CAPEX) and/or requires additional operational expenditures (OPEX). Thus, the unpredictability of climate-related impacts and associated design considerations to meet these variable impacts remains a key challenge. If these activities were to be recognized in financial models as business decisions, then the supporting projections would need to be integrated at an early upstream stage when projects are identified, structured, tendered, and financed, or when assets are sold or otherwise monetized.

Another challenge is that resilience interventions involve tradeoffs, risk management, and redundancies to account for climate uncertainty and equity. These approaches have traditionally been uncommon in investment planning.¹⁶² To be effective, resilience requires systems thinking, which may not be easily assessed with core universal climate metrics or checklists.¹⁶³ Multiple metrics consolidated into analytics could be combined with data representing qualitative actions.¹⁶⁴ Once developed, MDBs and governments would likely have to lead in applying these tools to lending and coordinating with DFIs, NDBs, and public and private investors.

Certainly, climate adaptation, resilience, biodiversity, and social inclusion can all be incorporated more systematically once required actions are outlined and linked with reportable key performance

159 OECD (Organisation for Economic Co-operation and Development). 2021. "Building resilience: New strategies for strengthening infrastructure resilience and maintenance." OECD Public Governance Policy Papers, No. 5, OECD Publishing, Paris. <https://doi.org/10.1787/354aa2aa-en>.

160 Cunniff, Shannon, and Aaron Schwartz. 2015. *Performance of Natural Infrastructure and Nature-Based Measures as Coastal Risk Reduction Features*. Environmental Defense Fund. https://www.edf.org/sites/default/files/summary_ni_literature_compilation_o.pdf.

161 Tye, Stefanie, John-Rob Pool, and Luciana Gallardo Lomeli. 2022. *The Potential for Nature-Based Solutions Initiatives to Incorporate and Scale Climate Adaptation*. World Resources Institute. <https://doi.org/10.46830/wriwp.21.00036>.

162 Seddon, Nathalie et al. 2020. "Understanding the Value and Limits of Nature-Based Solutions to Climate Change and Other Global Challenges." *Philosophical Transactions of the Royal Society B: Biological Sciences* 375 (1794). <https://doi.org/10.1098/rstb.2019.0120>.

163 Seddon et al. 2020. "Understanding the Value and Limits of Nature-Based Solutions to Climate Change and Other Global Challenges."

164 Hallegatte, Stephane, and Nathan L. Engle. 2019. "The Search for the Perfect Indicator: Reflections on Monitoring and Evaluation of Resilience for Improved Climate Risk Management." *Climate Risk Management* 23: 1–6. <https://doi.org/10.1016/j.crm.2018.12.001>.

indicators (KPIs). Developing the equivalent of the “Equator Principles” for climate change and broader sustainable development impact is the next key priority, together with their universal adoption.

ACTION AREA 4.3.2

Strengthen efforts to collect data on the integration of adaptation, resilience, nature-based and circular economy solutions in infrastructure, and develop associated methodologies and tools to operationalize emerging standards and indicators that address these themes.

4.4 The Proliferation of Climate, Sustainability, and ESG Standards

As better sustainability and ESG information, as well as associated tools for data application, become available, standards that qualify such data and define sustainable infrastructure throughout the project life cycle have become even more important.

Investor-targeted sustainability and ESG standards and taxonomies with guidance specifically for infrastructure include those led by large public-private sector coalitions (e.g., TCFD, Sustainability Accounting Standards Board / International Sustainability Standards Board [SASB/ISSB]); frameworks and taxonomies disseminated by governments and MDBs (e.g., EU Sustainable Finance Disclosure Regulation [SFDR] and Corporate Sustainability Disclosure Regulation [CSRD], IFC Definitions and Metrics for Climate-Related Activities¹⁶⁵); and granular requirements developed by industry participants, associations, and partners (e.g., Poseidon Principles for shipping, EDGE green building certification, BREEAM sustainability certification).

As with the ESG infrastructure data, standard setters understand the need to clarify this fragmented landscape of standards, and are collaborating with financial institutions, corporations, institutional investors, and regulators to:

- Improve the consistency, measurability, and comparability of climate and ESG information
- Combat greenwashing (and SDG-washing) of investments, promised impacts and labels
- Report all risks and opportunities, financial and non-financial, with material and relevant impacts
- Define impacts on society and the environment and align with development goals.

As long as these frameworks remain mostly voluntary, companies, financial institutions, and investment managers may find such guidance useful, but fragmentation of standards in the market and incomparability render them complex and costly to implement and report against. Table 4.1 maps out an inexhaustive list of key standards, frameworks, and taxonomies that have been used for infrastructure by preparers of sustainability information (e.g., developers, operators, infrastructure companies) and by investors (e.g., MDBs, banks, pension funds), and illustrates their relevance by level of disclosure and their specificity to infrastructure. Table 4.2 shows how the choice of standard often depends on the standard user's location in the institutional ecosystem.

¹⁶⁵ IFC (International Finance Corporation) Climate Business Department. 2017. “IFC’s Definitions and Metrics for Climate-Related Activities.” IFC. <https://www.ifc.org/wps/wcm/connect/8ebdc507-a9f1-4b00-9468-7b4465806ecd/IFC+Climate+Definitions+v3.1+.pdf?MOD=AJPERES&CVID=IQULLhw>.

**TABLE 4.1: SUSTAINABLE INFRASTRUCTURE DISCLOSURE STANDARDS
(ALSO SEE APPENDIX C)**

		Standard Focus			Issuer of Sustainability Disclosure			
Standard	Sector	Universal	Industry	Thematic	Project	Instrument	Entity	Portfolio
GRI	Multi							
ISSB	Private							
TCFD	Private							
SDG-Imp	Public							
IFC-PS	Public							
SFDR/CSDR	Public							
IS-FSD	Public							
CBI	Private							
ICMA GBP	Private							
Equator	Private							
CEEQUAL	Private							
Envision	Private							
SuRe	Private							
FAST-Infra	Private							

Notes: **GRI** = Global Reporting Initiative; **ISSB** = International Sustainability Standards Board ; **TCFD** = Task Force on Climate-Related Financial Disclosures; **SDG-Imp** = SDG Impact Standards ; **IFC-PS** = IFC Performance Standards; **SFDR/CSDR** = Sustainable Finance Disclosure Regulation/Corporate Sustainability Disclosure Regulation; **IS-FSD** = Foundation for Sustainable Development; **CBI** = Climate Bond Initiative; **ICMA GBP** = International Capital Markets Association Green Bonds Principles; **CEEQUAL** = Civil Engineering Environmental Quality Assessment & Award Scheme Manual; **Envision** = Institute for Sustainable Infrastructure Rating System; **SuRe** = Standard for Sustainable and Resilient Infrastructure; **FAST-Infra** = Finance to Accelerate the Sustainable Transition-Infrastructure.

TABLE 4.2: OVERVIEW OF CURRENT SUSTAINABLE AND ESG NORMS AND STANDARDS

Stakeholder	Goals	Norms	Standards
Government	SDGs, national targets, country development strategy	QII Principles Impact Principles Blended Finance Principles	IFC Performance Standards
MDB/DFI	SDGs, organizational sustainability goals		
Developer/operator/other corporate	SDGs, corporate net zero/renewable energy commitments, sector-specific (e.g. Poseidon Principles)		IFC Performance Standards, GRI, TCFD, SASB/ISSB, CDP, UNGC, Envision, SuRe, FAST Infra, EU CSDR
Finance provider	SDGs, corporate net zero/renewable energy commitments (including financed emissions), sector-specific (e.g. Poseidon Principles)	Principles for Responsible Banking Impact Principles	IFC Performance Standards, Equator Principles, GRI, TCFD, ISSB, CDP, EU SFDR, EU CSDR
Investor/asset manager		Principles for Responsible Investment Impact Principles	IFC Performance Standards, ISSB, TCFD, CDP, EU SFDR
Green/blue, sustainable, social bond issuer/instrument	SDGs, sector-specific	ICMA Green Bond Principles Social Bond Principles Sustainability Bond Guidelines Sustainability-Linked Loan Principles Climate Resilience Principles	Climate Bonds Standard national taxonomies

4.5 Harmonizing Climate, Sustainability, and ESG Standards for Infrastructure

The cost and complexity of implementing sustainability and ESG standards has spurred harmonization efforts across jurisdictions and regulations to formalize standards. The EU's Sustainable Finance Disclosures Regulation (SFDR) is the most notable and first major project of law. Additionally, the United States Securities and Exchange Commission (US SEC) has proposed climate disclosures that are awaiting comment, standards for infrastructure companies developed by the Sustainability Accounting Standards Board (SASB) are under review by its successor organization, the ISSB, and ISSB is currently

developing new climate-related disclosures building upon the recommendations of the TCFD.¹⁶⁶ With these efforts underway, the question remains on how to bring all of these regulations into alignment and ensure interoperability. At the same time, voluntary standards and taxonomies continue to proliferate at the margins, aiming to fill gaps and improve coherence.¹⁶⁷ Despite emerging agreement on universal core standards and indicators, this activity may reinforce some confusion among market participants.

Harmonization and convergence around a set of standards and taxonomies is critical. A 2022 global survey commissioned by the World Wildlife Fund and Guggenheim Investments on the collecting, reporting, and application of sustainability and ESG data in infrastructure projects suggests that more work needs to be achieved towards adopting harmonized and universal ESG standards and metrics. The survey—built on the participation of 50 leading institutional investors, commercial banks, MDBs, and DFIs—reveals that the multitude of sustainability and ESG frameworks in the market currently lack standardization and consistency in approach and industry-specific reporting standards, rendering it difficult to access necessary data on infrastructure performance and capture the financial impact of infrastructure projects on national, regional, or local scales.¹⁶⁸ Addressing this need, the G20 has endorsed efforts to converge on standards for harmonized, universal sustainability and ESG disclosures for infrastructure since the 2018 G20 Presidency of Argentina.

Similar convergence is needed on climate change standards, reporting, and taxonomies by the G20 and EMDEs for infrastructure, and these should be embedded in regulatory frameworks and national law. Notable examples include:

- MDBs' Common Principles for Climate Mitigation Finance Tracking,¹⁶⁹ as well as the *2020 Joint Report on Multilateral Development Banks' Climate Finance*,¹⁷⁰ tracks and counts activities that finance both climate mitigation and adaptation.
- ICMA provides a set of widely accepted market-based impact reporting metrics (qualitative and quantitative) for climate change adaptation projects, as well as reference reporting templates that issuers can adapt.¹⁷¹
- The G20 QII Principles offer a framework for promoting quality in infrastructure investments that build on core sustainability principles around economic efficiency, environmental and social considerations, resilience, and infrastructure governance.¹⁷²

166 ISSB. 2022. *Exposure Draft: IFRS Sustainability Disclosure Standard (IFRS S2 Climate-related Disclosures)*. IFRS Sustainability (International Financial Reporting Standards). <https://www.ifrs.org/content/dam/ifrs/project/climate-related-disclosures/issb-exposure-draft-2022-2-climate-related-disclosures.pdf>

167 Serebrisky, Tomás, et al. 2018. *IDBG Framework for Planning, Preparing, and Financing Sustainable Infrastructure Projects: IDB Sustainable Infrastructure Platform*. IDB (Inter-American Development Bank). <https://doi.org/10.18235/0001037>.

168 Guggenheim Investments, World Wildlife Fund, Mott MacDonald, KPMG. 2022. *Testing Industry Attitudes Toward a Common Reporting Approach for ESG Data Use in Infrastructure Investment*. Guggenheim Investments, August 2022. <https://www.guggenheiminvestments.com/GuggenheimInvestments/media/PDF/2022-KPMG-ESG-Data-Report.pdf>.

169 World Bank. *Common Principles for Climate Mitigation Finance Tracking*. <https://www.worldbank.org/content/dam/Worldbank/document/Climate/common-principles-for-climate-mitigation-finance-tracking.pdf>.

170 World Bank Group. 2021. "MDBs' Climate Finance for Developing Countries Rose to US\$ 38 Billion, Joint Report Shows." World Bank (press release), July 2, 2021. www.worldbank.org/en/news/press-release/2021/07/02/mdbs-climate-finance-for-developing-countries-rose-to-us-38-billion-joint-report-shows.

171 ICMA. *Green Bonds: Working Towards a Harmonised Framework for Impact Reporting for Climate Change Adaptation Projects*. 2020. <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Suggested-metrics-for-Climate-Adaptation-projects-with-Reporting-Templates-December-2020-151220.pdf>

172 Japanese G20 Presidency 2019, "G20 Principles for Quality Infrastructure Investment," 2019, https://www.mof.go.jp/english/policy/international_policy/convention/g20/annex6_1.pdf

- The Aligned Indicators for Sustainable Infrastructure (AISI), a joint initiative of MDBs and other partners (see footnote for additional details), to be released by year-end 2022, comprise core, “common denominator” ESG indicators across the project life cycle. The working list of 13 key topics and 27 indicators includes a definition, metric, and unit of measurement, as well as the relevant project phase and alignment to the SDGs.^{173, 174}
- The just released Compendium of Quality Infrastructure Investment Indicators prepared for the G20¹⁷⁵ offers a voluntary, non-binding, customizable set of indicators, drawing on indicators already in use, to be used at the project level.

As efforts at harmonization continue, certain issues will need to be addressed for infrastructure:

- Relative benefits of industry- and sector-specific granularity versus harmonized universal indicators
- Need for improvement in economic, institutional, social and governance criteria¹⁷⁶
- Point of use and reporting over the entire project cycle (i.e., ex-ante and ex-post)
- Difficulty of quantifying climate, sustainability and ESG data in financial terms
- Aggregating and benchmarking projects, programs, and portfolios (Box 4.3).

¹⁷³ AISI is a collaborative effort funded by the World Bank, PPIAF, Global Infrastructure Basel (GIB), and European Bank for Reconstruction and Development (EBRD), with CEEQUAL, Global Infrastructure Facility (GIF), Institute for Sustainable Infrastructure (ISI), Infrastructure Sustainability Council of Australia (ISCA), GRESEB, and Long-term Infrastructure Investor Association (LTIIA) serving as core partners. GIB Foundation. “Sustainable Infrastructure Standards Collaboration.” <https://gib-foundation.org/sustainable-infrastructure-standards-collaboration/>.

¹⁷⁴ The Multilateral Development Bank (MDB) Infrastructure Cooperation Platform (ICP) Sustainable Infrastructure Workstream, supported by the G20 Infrastructure Working Group (IWG), prepared a report on a common set of aligned sustainable infrastructure indicators based on MDB published sustainable infrastructure frameworks and ongoing MDB initiatives presenting good practices on sustainable infrastructure investment and monitoring (with reference to AISI). The report presents a stocktake of some of the ICP members latest initiatives and frameworks to identify the common elements that they are using to define sustainable infrastructure. Inter-American Development Bank (IDB). 2020. *A Common Set of Aligned Sustainable Infrastructure Indicators (SII)*. <https://publications.iadb.org/publications/english/document/MDB-Infrastructure-Cooperation-Platform-A-Common-Set-of-Aligned-Sustainable-Infrastructure-Indicators-SII.pdf>

¹⁷⁵ GIH (Global Infrastructure Hub). “Compendium of QII Indicators.” <https://cdn.github.org/umbraco/media/4761/compendium-of-qii-indicators.pdf>.

¹⁷⁶ In Serebrisky et al. (2018), commonly used project-level infrastructure standards were reviewed against a comprehensive list of criteria for all four sustainability dimensions (i.e., economic and financial, environmental, social, and institutional). The study concluded that, within the upstream planning stage, substantial gaps existed in all four dimensions. Within the project preparation stage of the project cycle, there was relatively strong alignment on environmental criteria, but uneven performance within the other sustainability dimensions. Similarly, during the project financing stage, there was also strong performance on environmental criteria, but economic, institutional and social criteria were uneven, or illustrated serious gaps.

BOX 4.3: SUSTAINABLE INFRASTRUCTURE BENCHMARKING

Benchmarking via the use of composites has its challenges, which include the potential distortions of contributed versus market representative data, comparability across sectors and lack of methodological transparency. However, benchmarking can potentially advance the goal of standardization by embedding baseline standards systematically into analytics.

One well-established example of this is the **Global Real Estate Sustainability Benchmark (GRESB)**, which launched an infrastructure asset-level assessment¹⁷⁷ at the request of large institutional investors that leverages existing core standards. Unfortunately, results are only accessible to investors approved by the reporter. However, established platforms like GRESB that have gained buy-in from institutional investors can help with harmonization.

Another dimension of benchmarking is seen in the **École des hautes études commerciales du Nord's (EDHEC's) expanded classification standard (TICCS)**, which now features sustainability mapping for EU taxonomy alignment.¹⁷⁸ By enabling investors to classify holdings versus the EU taxonomy for sustainable activities, it should become easier to analyze performance of sustainable assets and seek out necessary data to support sustainability and ESG analysis.

Sources: GRESB, EDHEC.

¹⁷⁷ GRESB. 2022. "GRESB Resources." <https://www.gresb.com/nl-en/industry-insights/resources/>.

¹⁷⁸ EDHECinfra. "Investing Transparently in Infrastructure."

With harmonization efforts under way, the benefits of scaling such initiatives include improved quantitative disclosure, life-cycle reporting, enhanced consideration of cross-cutting themes (e.g., climate), transparency on project performance, and tracking of disclosure quality. Project information aligned with mandatory universal core standards could be labeled as such, as would supplemental information that exceeds minimum requirements (see Box 4.4 for an example of this already under implementation).

BOX 4.4: SUSTAINABLE INFRASTRUCTURE CERTIFICATION AND LABELING

Because sustainable infrastructure encompasses a complex range of concepts, certifications and labels can help project developers attain performance standards desired by investors and aid investors in finding projects that meet sustainable investment mandates. For example, the **FAST-Infra Sustainable Infrastructure Label** features 14 sustainability criteria across environmental, social, governance, and adaptation and resilience dimensions tied to standard metrics and methods emerging from a mapping of over 25 standards, taxonomies and frameworks.¹⁷⁹

Source: CPI.

¹⁷⁹ FAST-Infra. 2021. "FAST-Infra Sustainable Infrastructure Label: Dimensions & Criteria Indicators." https://www.climatepolicyinitiative.org/wp-content/uploads/2021/11/FAST-Infra-SI-Dimensions-and-Criteria-Indicators_FINAL-161221.pdf.

Strengthening a clear, accessible, and prescribed core minimum for sustainable infrastructure projects from existing standards may draw higher participation and simplify investor assessments. Such reporting could encourage a virtuous cycle that leverages artificial intelligence (AI) technology and growing digitized reporting to facilitate the analysis and comparison of information.¹⁸⁰ Simplifying project-level sustainability and ESG standards can create upstream, midstream, and downstream benefits for companies and investors:

- **Upstream**—most flexible stage for prioritizing and designing for sustainability
- **Midstream**—project preparation guided by climate goals and sustainability and ESG principles to develop project features, management systems and data collection
- **Downstream**—support investor assessment and link with finance (e.g., sustainability-linked bonds) and improve O&M.

ACTION AREA 4.5

Harmonize around a core set of standards, taxonomies, reporting measures, and indicators for sustainable infrastructure to reduce fragmentation and promote cohesion. Harmonization should build on existing collaborative efforts, with resources (funding and collaborations) channeled towards promoting good market guidance such that standards and indicators are not just adopted, but also applied at scale.

¹⁸⁰ IFC (International Finance Corporation). Final Presentation. IFC webinar. https://www.ifc.org/wps/wcm/connect/0cc67c8d-8190-49c6-a84d-0a8957b09d27/Final+Presentation+MALENA_Webinar.pdf?MOD=AJPERES&CVID=mTmbeKJ.

Analytical Approach

The analytical approach included comprehensive desk research, literature review, and mapping of current, successful, scalable, and replicable initiatives and emerging, innovative strategies that have surfaced in recent years and contribute to the global agenda of mobilizing private capital. Another critical part of the methodology was high-level interviews with market players who helped deepen and validate the analysis, which drove the insights and action areas and mapped to the stakeholders across the infrastructure project life cycle in the report. Table A.1 below identifies individuals representing the financial services and asset management industry, standard setters, project development and preparation facilities, private foundations, not-for-profit corporations, and MDBs, with whom the GIF conducted interviews to contribute to this stocktake report with their insights and expert opinions on mobilizing private capital for sustainable infrastructure investments in emerging markets and developing economies. The conversations focused on sustainable infrastructure policy priorities to help bridge the infrastructure investment gap and the importance of strengthening project preparation facilities and public sector engagement in EMDEs. The discussions also analyzed the most innovative and scalable sustainable infrastructure finance solutions, their structure design, risk profile, challenges, and constraints for replicability. Lastly, the interviews explored the role norms and standards play in ensuring organizations' alignment with the SDGs, and the availability of infrastructure performance data to facilitate the investment decision process for a wide range of players. The dialogue produced a series of findings and action areas to advance the private sector's participation in sustainable infrastructure investments in EMDEs that are reflected across the project life cycle in the report. The peer reviewers contributed to the global stocktake report by providing an expert-level assessment of the overall report composition, its narrative, clarity, and, specifically, key findings and action areas discovered throughout the process regarding private and public market participants and their ability to allocate resources to sustainable, quality infrastructure, especially in emerging markets and developing economies.

TABLE A.1: LIST OF FORMAL AND INFORMAL INTERVIEW PARTICIPANTS

Name	Title	Organization
Chris Clubb	Managing Director, Europe	Convergence
Nnamdi Igbokwe	Director, Knowledge and Thought Leadership	Convergence
Alicia Maitland	Senior Associate, Training & Engagement	Convergence
Matthew Jordan-Tank	Director, Sustainable Infrastructure Policy and Project Preparation	EBRD
Curtis Ravenel	Senior Advisor to the Co-Chair and Vice Chair	GFANZ
Daniel Firger	Managing Director	Great Circle Capital Advisors

TABLE A.1: LIST OF FORMAL AND INFORMAL INTERVIEW PARTICIPANTS, CONTINUED

Name	Title	Organization
Cathy Granneman	Manager Member Relations - Infrastructure	GRESB
Dan Winters	Senior Director – Market Development and Strategic Initiatives	GRESB
Christian Déséglise	Head of Sustainable Finance and Investments, Global Banking and Markets	HSBC
Michael Ridley	Director, Responsible Investment, Global Asset Management	HSBC
Laurence W. Carter	Senior Advisor	IFC
Shalabh Singhanian	Director, Portfolio Management	InfraCo Asia
Mathieu Peller	Partner, Chief Operating Officer Africa	Meridiam
Douglass Sims	Senior Director, Resilient Communities Division, Healthy People and Thriving Communities Division	NRDC
Philippe Valahu	Chief Executive Officer	PIDG
Jemima T. Sy	Program Manager	PPIAF
Richard Abadie	Global Leader, Capital Projects & Infrastructure, and Partner	PwC UK
Maria Kozloski	Senior Vice President, Innovative Finance	Rockefeller Foundation
Veronika Bienert	Chief Executive Officer	Siemens Financial Services
Thomas Brauchle	Head of Sustainability	Siemens Financial Services
Daniel Vogel	Head of Strategic Development	Siemens Financial Services
David Taff	Chief Executive Officer	Siemens Participacoes Ltda
Alper Kilic	Managing Director, Global Head of Project and Export Finance	Standard Chartered
Jérôme Haegeli	Group Chief Economist	Swiss Re

Sustainable Infrastructure Investment Databases

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES

Category: Data/Tools		
Subcategory	Name	Short Description
Analytics/ Benchmarks	Carbon Risk Real Estate Monitor (CRREM)	CRREM will accelerate the decarbonization and climate change resilience of the EU commercial real estate sector by clearly communicating the downside financial risks associated with poor energy performance and quantifying the financial implications of climate change on the building stock. Therefore, CRREM will provide the industry with appropriate science-based carbon reduction pathways at the building, portfolio and company level and with financial risk assessment tools to cost-effectively manage carbon mitigation strategies. The project aims to optimize the industry’s investments in energy-efficient retrofits by making risks more transparent and unveiling opportunities for property owners and investors. CRREM will provide the industry with a tool to assess “stranding” risks, applicable GHG-reduction pathways according to the Science-Based Targets initiative, and reporting templates, which will contribute to accelerating the decarbonization of the EU building stock to “2-degree readiness.”
Analytics/ Benchmarks	Data Alliance, Moody's Analytics	<p>The Data Alliance is a collaborative effort of leading financial institutions and Moody's Analytics to create the world's largest collection of private credit risk data, augment internal datasets, discover gaps in data quality, and compare portfolio risk and lending practices to peers for actionable. The alliance’s datasets comprise:</p> <ul style="list-style-type: none"> • More than 90 of the world’s leading banks, insurers, asset managers, and multilateral development banks • Nearly 100 million financial statements representing more than 20 million global private firms, with more than 2.9 million defaults • A large income-producing real estate (IPRE) and construction commercial real estate (CRE) dataset with more than \$372 billion in loan volume and more than 66,000 properties covering 354 metropolitan areas • More than 6,000 project finance transactions and 450-plus defaults, representing more than 63 percent of all project finance loans since 1983 • Broad asset class coverage that includes commercial and industrial (C&I), CRE, middle-market (SME) private firms, and project and infrastructure finance.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Analytics/ Benchmarks	EDHEC infraMetrics	InfraMetrics equity indices include the widely used infra300 and infra100 index families, as well as several other thematic and geographic indexes. Other thematic and geographic indexes include the InfraAmericas, Infra-AsiaPac and infraNorthenEurope equity indexes, and the infraLongTerm Debt index. Index data include index values and returns, constituents, The Infrastructure Company Classification Standard (TICCS) allocations, and performance and analytics, and are available monthly for all indexes.
Analytics/ Benchmarks	EIU Infrascop Series	Built by the Economist Intelligence Unit (EIU) and with funding and collaboration from MDB partners, Infrascop is a benchmarking index that assesses the capacity of countries to deliver sustainable public-private partnerships in infrastructure. All MDBs, including EBRD through the IPPF, are contributing to a “global refresh” of the index by funding some 15 to 20 countries per region on the same standard methodology for the first time. This will allow Infrascop to be of even greater value to emerging market governments and investors.
Analytics/ Benchmarks	GRESB Infrastructure Asset Assessment	The Infrastructure Asset Assessment assesses ESG performance at the asset level for infrastructure asset operators, fund managers and investors that invest directly in infrastructure. The assessment offers high-quality ESG data and advanced analytical tools to benchmark ESG performance, identify areas for improvement and engage with investors.
Analytics/ Benchmarks	IHS Markit Global Carbon Index	The IHS Global Carbon Index is the first benchmarking and liquid investable index to track carbon credits markets globally. It tracks the most liquid segment of the tradable carbon credit futures markets. Constituents of the Global Carbon Index include futures contracts on European Union Allowances (EUA), UK Allowances (UKA), California Carbon Allowances (CCA) and the Regional Greenhouse Gas Initiative (RGGI), with pricing data from OPIS by IHS Markit Pricing (North American pricing) and ICE Futures Pricing (European pricing).
Analytics/ Benchmarks	Infrastructure finance by bilateral and multilateral development partners	The OECD Development Assistance Committee (DAC) captures the flows of official development finance (ODF) for infrastructure, which include official development assistance (ODA) and other official flows (OOF). The ODF for infrastructure data is disaggregated into four sectors and 45 sub-sectors. In this context, quantitative and qualitative research is conducted to analyze strategies and activities of development partners in supporting projects and in mobilizing private sector resources for infrastructure in developing countries.
Analytics/ Benchmarks	Moody’s Climate Solutions	Moody’s Climate Solutions offers a broad spectrum of climate solutions and insights, ranging from entity level information to macro level analytics, spanning identification and quantification of climate risk and readiness.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Analytics/ Benchmarks	Morningstar Sustainable Investing Indexes	Morningstar Global Corporate Bond Sustainability Index Morningstar US Corporate Bond Sustainability Index Morningstar Canada Corporate Bond Sustainability Index Morningstar Eurozone Corporate Bond Sustainability Index Morningstar US Sustainability Index Morningstar Global Markets Sustainability Index Morningstar Developed ex-US Sustainability Index Morningstar EU Climate Indexes
Analytics/ Benchmarks	MSCI Thematic and ESG Indexes	MSCI ACWI IMI Efficient Energy Index MSCI ACWI IMI Renewables and Energy Efficiency Index MSCI ACWI IMI Sustainable Water Transition Index MSCI ACWI IMI Smart Cities Index MSCI ACWI IMI Clean Energy Infrastructure Index MSCI Climate Change Bloomberg MSCI Green Bonds
Analytics/ Benchmarks	S&P Dow Jones Climate, Green Real Estate and Green Bonds Indices	Designed to address climate change and the transition to a low-carbon economy, these indexes address different carbon reduction objectives—including carbon-efficient and fossil-fuel-free-strategies. The indexes use both current and forward-looking approaches, as well as those that align with the Task Force for Climate-related Financial Disclosures (TCFD). S&P Green Bond Index S&P Green Bond Select Index S&P Green Bond U.S. Dollar Select Index S&P U.S. Municipal Green Bond Index Dow Jones Global Ex-U.S. Select ESG RESI Dow Jones Global Select ESG RESI Dow Jones U.S. Select ESG REIT Index
Analytics/ Benchmarks	Sustainalytics (Morningstar company)	Sustainalytics, a Morningstar company, provides high-quality, analytical environmental, social and governance (ESG) research, ratings and data to institutional investors and companies.
Data/ Research	Bloomberg NEF database	Industry coverage comprises: sector transition: clean power (solar, wind, storage, decentralized energy, power systems and networks), advanced transport (electrified transport, mobility services, connected and autonomous vehicles, next-generation aviation/shipping), buildings and industry (low-carbon heating and cooling circular economy, green steel and aluminum, sustainable plastics and chemicals, low-carbon cement), agriculture/land (agri-chemicals and biotechnology, land and water management, alternative proteins and food demand, food waste management, agricultural technology and supply chain).
Data/ Research	Carbon Tracker	The Carbon Tracker is an independent financial think tank that carries out in-depth analysis on the impact of the energy transition on capital markets and the potential investment in high-cost, carbon-intensive fossil fuels.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Data/ Research	China Overseas Finance Inventory (COFI) database	A comprehensive database on Chinese equity and debt investments in power generation sector in Belt and Road Initiative countries.
Data/ Research	Creating Green Bond Markets (SBFN-IFC)	The Sustainable Banking and Finance Network (SBFN) is a platform for knowledge sharing and capacity building on sustainable finance for financial sector regulators and industry associations across emerging markets. Facilitated by IFC as secretariat, and supported by the World Bank Group, SBFN helps mobilize information, resources, and practical support for members to design and implement national initiatives that advance sustainable finance at national, regional, and global levels.
Data/ Research	Database on ODF for infrastructure	This online database shows: ODF for infrastructure by sector; ODF for water supply and sanitation by sub-sector; ODF for transport and storage by sub-sector; ODF for communication by sub-sector; and ODF for energy by subsector.
Data/ Research	EDHEC Infra database	The EDHEC Infra database is a collection of cash flow, investment and balance sheet data collected from infrastructure investors and creditors. To date, the database covers more than 500 individual infrastructure assets over 10 different countries and a period of 15 to 20 years, making it the most comprehensive database of infrastructure cash flows available for research.
Data/ Research	Emerging Markets Sustainability Dialogues	EMSD serves as an independent knowledge platform and incubator for sustainable infrastructure development in and with emerging markets. Its work on years of multi-stakeholder engagement with change makers from the private, public and financial sectors seeks to advance the global debate on how to put in place infrastructure that meets the demands of the 2030 Agenda and Paris Agreement. It offers technical expertise, financial support and the reach of the German Agency for International Cooperation's (GIZ) global network to help implement and scale innovative solutions for sustainable infrastructure development.
Data/ Research	Energydata.info	Energydata.info is an open data platform providing access to datasets and data analytics that are relevant to the energy sector. Energydata.info has been developed as a public good available to governments, development organizations, the private sector, non-governmental organizations, academia, civil society and individuals to share data and analytics that can help achieve UN SDG7 of ensuring access to affordable, reliable, sustainable and modern energy for all.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Data/ Research	GIH InfraCompas	InfraCompass is a tool for infrastructure policy makers that objectively quantifies the strength of the infrastructure enabling environment by aggregating data for 81 countries, collectively representing 93 percent of global GDP and 86 percent of the world population. It aims to help governments and policy specialists assess where a country is performing well and where there are opportunities for improvement, allowing them to identify policies that will lead to better public and private infrastructure investment. InfraCompass ranks countries across eight drivers: governance, regulatory frameworks, permits, planning, procurement, activity, funding capacity, and financial markets. These eight drivers are underpinned by 41 individual metrics.
Data/ Research	Global Infrastructure Hub	The Global Infrastructure Hub (GIH) is a not-for-profit organization, formed by the G20 that advances the delivery of sustainable, resilient, and inclusive infrastructure. It collaborates with the public and private sectors, acting as a knowledge sharing hub, to produce data, insights, knowledge tools, and programs that inform both policy and infrastructure delivery. These resources help decision-makers, policy makers, and practitioners create positive impacts through infrastructure.
Data/ Research	Global Infrastructure Hub and EDHEC survey of Investor Perceptions of Infrastructure, 2017	The GI Hub and EDHEC Infrastructure Institute-Singapore (EDHECinfra) are jointly responsible for the Investor Perceptions of Infrastructure 2017 survey, which revealed investor preferences and trends in infrastructure markets. More than 185 infrastructure investors and advisors—representing \$7 trillion in assets and 10 percent of global assets under management—took part in the survey. The study was the largest of its kind involving senior executives, investment directors and advisors in the infrastructure sector.
Data/ Research	Global Infrastructure Hub Infrastructure Outlook	The GIH's Infrastructure Outlook is an online interactive tool showing infrastructure investment needs in 50 countries, with granular data on the size of the infrastructure gap, on a country-by-country, sector-by-sector basis. It also provides data on the spending necessary to achieve the infrastructure-related aspects of the Sustainable Development Goals. The Infrastructure Outlook is designed to assist governments and the private sector in prioritizing and planning future spending. In 2018, Infrastructure Outlook was updated to include data from countries in the Compact with Africa Program.
Data/ Research	Global Infrastructure Hub Project Pipeline	The GIH launched the Global Infrastructure Project Pipeline in late 2015, following extensive consultations with private sector investors as to the information that the database should contain. The resulting product presents information directly provided by national and local procuring authorities, updated as projects progress through eight designated stages of the procurement process. The Global Infrastructure Project Pipeline gives procuring authorities the ability to showcase proposed projects to a global audience of prospective investors. It is designed to integrate with national, sub-national and MDB project databases, and it can accommodate both domestic and multi-jurisdictional connectivity projects.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Data/ Research	Global Infrastructure Hub Knowledge Hub	The GIH's Knowledge Hub website contains an extensive database of categorized infrastructure resources. The tool has been created to help infrastructure professionals globally to easily find resources that pertain to infrastructure tools, data, publications, organizations, and reports.
Data/ Research	IDB Hub de Energía	The IDB's Energy Hub is the digital meeting point that compiles, integrates, disseminates, and drives the generation of data and information on the energy sector of Latin America and the Caribbean in a single place. The Energy Hub works with partners to collect data and information for the public on different areas of interest, in particular, the infrastructure of energy services, access, and affordability, innovation, renewable energy, and investment, among others. The hub facilitates the search and use of data and directs the user to the original data sources, speeding use in a reliable and timely manner.
Data/ Research	IJ Global	The database covers all infrastructure sectors (social and defense, mining, oil and gas, renewable energy, water, and transport), for all geographies and both project finance and corporate balance sheet financing transactions. The database provides extensive details on the transactions, including pricing details when available. However, public financing transactions, as well as China, are not covered.
Data/ Research	Infralatam	Infralatam's aim is the standardized estimation of resources allocated to economic infrastructure (water and sanitation, energy, irrigation, telecommunications and transportation) in order to make comparisons between countries and periods, considering both public—national and sub-national—and private investment. This task, started in 2011, is being deepened and expanded jointly by CAF, IDB and the Economic Commission for Latin America and the Caribbean (ECLAC), all multilateral institutions profoundly committed to the development of the region's countries.
Data/ Research	Preqin	Preqin is a privately held London-based investment data company that provides financial data and information on the alternative assets market, as well as tools to support investment in alternatives. The company's data encompasses private capital and hedge funds, including fund, fund manager, investor, performance and deal information. The asset classes it covers are: private equity, venture capital, hedge funds, private debt, real estate, infrastructure, natural resources and secondaries.
Data/ Research	Quality Infrastructure Investment Database	The Quality Infrastructure Investment Database is an initiative of the G20 under the 2019 Japanese Presidency, in collaboration with the Global Infrastructure Hub, the OECD and the World Bank. The database includes resources and facilities relevant to Quality Infrastructure Investment under the principles of sustainable growth and development, economic efficiency, environmental considerations, building resilience, social considerations, and infrastructure governance.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Data/ Research	Refinitiv	Refinitiv has the most comprehensive set of news, data, insights and analytics available on global infrastructure developments from rumor to close, including deal structuring, financing, risk profiling, regulatory compliance and lender, investor and advisor profiles.
Data/ Research	S&P Global Trucost	Trucost intelligence helps corporations, financial institutions, and governments to build resilience and get ahead in the transition to a low carbon, sustainable and equitable future—as well as being the data and analytics engine that powers many of S&P Global’s ESG solutions.
Data/ Research	Sustainable Infrastructure Foundation SOURCE	SOURCE acts as an infrastructure data collector and database, by aggregating and analyzing the structured data published on its platform by project developers (infrastructure data, financial data, environmental and social data, etc.), in order to create statistics and financial benchmarks. SOURCE is also designed as a data provider for financial institutions willing to invest through equity or loans in infrastructure projects and thus contribute to the G20 goal of developing infrastructure as an asset class.
Data/ Research	Sustainable Stock Exchanges initiative	The SSE initiative is a United Nations (UN) Partnership Program organized by the UN Conference on Trade and Development (UNCTAD), the UN Global Compact, the UN Environment Programme Finance Initiative (UNEP FI) and the Principles for Responsible Investment (PRI). The SSE’s mission is to provide a global platform for exploring how exchanges, in collaboration with investors, companies (issuers), regulators, policy makers and relevant international organizations, can enhance performance on ESG issues and encourage sustainable investment, including the financing of the UN SDGs.
Data/ Research	EU Copernicus Climate Change Data Service (C3S)	The C3S data integrated SAVi assessments provide a systemic valuation of infrastructure assets, informing policy makers as they assess their policy priorities and work to fulfill their national and international climate commitments. In addition, the insights developed from these assessments show governments, investors, and project developers why low-carbon, resource-efficient, and climate-resilient infrastructure brings the most attractive returns to capital holders and the public alike.
Data/ Research	Global Emerging Markets Risk Database Consortium (GEMs)	The GEMs is one of the world’s largest credit risk databases for the emerging markets operations of its member institutions, which are MDBs and DFIs. It pools data on credit defaults on the loans extended by consortium members, the migrations of their clients’ credit ratings and the recoveries on defaulted projects. GEMs was established in 2009 as a joint initiative between the European Investment Bank (EIB) and the International Finance Corporation (IFC of the World Bank Group). Since then, the GEMs consortium has grown to include 24 member MDBs and DFIs.
Data/ Research	Nature-Based Infrastructure Global Resource Centre	The NBI Global Resource Centre aims to bring together key partners to establish a business case for nature-based infrastructure (NBI). It provides data, training, and sector-specific valuations based on the latest innovations in systems thinking and financial modeling.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Rating/ Assessment	Anticipated Impact Measurement and Monitoring (AIMM), IFC	The AIMM tool better defines, measures, and monitors each project's development impact. IFC currently scores all of its investment projects for development impact using the AIMM system and has recently started to rate advisory service projects. The AIMM system is now fully integrated into IFC's operations, allowing development impact considerations to be weighed against various strategic objectives, including volume, financial return, risk, and thematic priorities.
Rating/ Assessment	Climate Change Physical Risk Toolkit	<p>The Climate Change Physical Risk Toolkit helps asset owners and managers better understand and manage the potential physical impacts of climate change on their investments.</p> <p>The toolkit includes:</p> <ul style="list-style-type: none"> • An investor perspective on the scientific and macroeconomic context for understanding physical climate change risks • A step-by-step scoping methodology to identify physical climate risks and opportunities, with an illustrative case study to demonstrate how the methodology can be applied • A disclosure guide with criteria to support an investor's assessment of physical risk disclosures and metrics • A resource guide of credible third party sources of information on climate risks and opportunities, accessible on the Investor Leadership Network (ILN) website as a searchable, interactive database.
Rating/ Assessment	EIB Project Carbon Footprint Methodologies	EIB Project Carbon Footprint Methodologies provide guidance to EIB staff on how to calculate the carbon footprint of the investment projects financed by the EIB. The document also presents how the EIB calculates the carbon footprint of its investment projects to its auditors, external stakeholders and other interested parties. The bank works closely with other financial institutions and stakeholders in its footprinting work and welcomes further feedback on the methodology. The EIB's methodology is in line with the International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting, published in November 2015.
Rating/ Assessment	Harmonized Indicators for Private Sector Operations (HIPSO)	The Harmonized Indicators for Private Sector Operations (HIPSO) are the result of an effort to standardize the criteria that development finance institutions use to assess the impact of their work with private sector clients. These criteria are measured via a system of indicators and collected via reports that most DFIs require of their clients. The HIPSO provide general and sector infrastructure KPIs intended for DFI operations
Rating/ Assessment	IRIS+	IRIS+ is the generally accepted system for impact investors to measure, manage, and optimize their impact. IRIS+ provides data clarity and comparability and offers streamlined, practical, how-to guidance that impact investors need. It is a free, publicly available resource managed by the Global Impact Investing Network (GIIN)— the global champion of impact investing.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Rating/ Assessment	Sustainable Asset Valuation (SAVi)	The Sustainable Asset Valuation (SAVi) helps policy makers and investors make informed decisions on infrastructure financing based on customized simulations. The tool forecasts how infrastructure projects will affect and be affected by the environmental, social and economic dynamics and simulates how different risk scenarios affect a project's financial viability across its life cycle and how material externalities can affect future cash flows. Thereby, SAVi allows evaluation of the financial attractiveness of infrastructure projects across their life cycles, considering important environmental, social, economic and governance factors that are overlooked in traditional valuations, and to compare different infrastructure scenarios and their financial viabilities.
Rating/ Assessment	Sustainable Infrastructure Guidelines for Overseas Chinese Contractors	The Sustainable Infrastructure Guidelines for Chinese International Contractors (SIG) are a voluntary guidance document developed by the China International Contractors Association for Chinese enterprises engaged in infrastructure projects overseas to enhance sustainability performance across economic, social, environmental and governance aspects. The guidelines propose a broad set of sustainability indicators overing the entire life cycle from funding, planning, design, building, O&M to closure. The SIG may also serve as a tool for evaluation of sustainability on completed projects.
Rating/ Assessment	Sustainable Transportation Analysis & Rating System (STARS)	STARS (the Sustainable Transportation Analysis & Rating System) is an integrated planning framework for transportation plans, projects, and programs. Based on sustainability principles, STARS gives planners, citizens and decision-makers the ability to evaluate the full life cycle of transportation plans and projects, identifying innovative options and improving decision-making.
Analytics/ Benchmarks	ESG Data Convergence Project	Leading global general partners and limited partners (LPs) have partnered to align on a standardized set of ESG metrics and mechanisms for comparative reporting. The project's objective is to streamline the private investment industry's historically fragmented approach to collecting and reporting ESG data in order to create a critical mass of meaningful, performance-based, comparable ESG data from private companies. This allows GPs and portfolio companies to benchmark their current position and generate progress toward ESG improvements while enabling greater transparency and more comparable portfolio information for LPs.
Analytics/ Benchmarks	SDG Investor Platform's market intelligence map	The SDG Investor Platform is powered by the UNDP and created by the Sustainable Finance Hub (SFH) initiative SDG Impact, which focuses on generating and leveraging private sector capital in delivering the SDGs. It aims to provide investors, businesses and others with unified standards, tools, and services required to authenticate their contributions to achieving the SDGs and to identify SDG investment opportunities in emerging economies and developing countries.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Data/ Research	PPP Knowledge Lab	This website brings together the most relevant and authoritative resources on public-private partnerships in one location to empower governments and their advisors to design and deliver best-in-class infrastructure projects. The PPP Knowledge Lab serves the needs of governments and practitioners alike, filling the gap in reliable, trustworthy knowledge about public-private partnerships.
Data/ Research	Public-Private Partnership Legal Resource Center (PPPLRC)	This website, hosted by the World Bank Group, provides easy access to an array of sample legal materials which can assist in the planning, design and legal structuring of any infrastructure project—especially a project which involves a public-private partnership. It is organized in two broad categories: guidance on structuring a PPP project and its enabling environment and sector specific information.
Rating/ Assessment	Greenroads Rating System	The Greenroads Rating System is an easy way to measure and manage sustainability on transportation projects. The rating system is the core publication used in the Greenroads Project Rating Program, which challenges project teams to go beyond minimum environmental, social, and economic performance measures and evaluate projects through independent, expert, third-party review.
Data/ Research	Climate Toolkits for Infrastructure PPPs (CTIP3)	Developed by the WBG, GIF, and PPIAF, CTIP3 provides tools and guidance for embedding climate change mitigation and climate change adaptation risks and opportunities in planning for infrastructure PPPs. At the most upstream stages, the toolkit assesses the enabling environment and broader institutional capacity among client governments to integrate climate considerations in the identification and development of potential PPP opportunities. Further midstream, the toolkits provide guidance at the project-level, evaluating specific programs and projects, and pipeline opportunities for potential climate components.
Data/ Research	Resilience Shift	The Resilience Shift focuses on tools and approaches to put resilience thinking into practice, identifying the drivers and enablers for infrastructure resilience, and advancing a common understanding of resilient systems within and between critical infrastructure sectors.
Data/ Research	Transforming Energy Access (TEA)	Transforming Energy Access (TEA) is a research and innovation platform supporting the technologies, business models and skills needed to enable an inclusive, clean energy transition.
Data/ Research	World Bank PPI Database	The Private Participation in Infrastructure Projects Database is a product of the World Bank’s Public Private Partnership Group. Its purpose is to identify and disseminate information on private participation in infrastructure projects in low- and middle-income countries. The database highlights the contractual arrangements used to attract private investment, the sources and destination of investment flows, and information on the main investors.

TABLE B.1: LIST OF INFRASTRUCTURE INVESTMENT DATABASES, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Rating/ Assessment	Impact Management Project (IMP)	The Impact Management Project (IMP) began in 2016 as a time-bound forum for building global consensus on how to measure, assess and report impacts on people and the natural environment.
Rating/ Assessment	True Zero Waste	TRUE is a whole systems approach aimed at changing how materials flow through society, resulting in no waste. TRUE encourages the redesign of resource life cycles so that all products are reused. TRUE promotes processes that consider the entire life cycle of products used within a facility. With TRUE, a facility can demonstrate to the how it is minimizing its waste output.
Analytics/ Benchmarks	Transition Pathway Initiative tool	The Transition Pathway Initiative (TPI) tool's aim is to empower investors to understand and drive the low-carbon transition by providing independent, open-access data showing whether the world's largest high-emitting companies are adapting their strategies to align with international climate goals. The TPI tool assesses companies on two dimensions based on publicly available information: management quality, or the quality of companies' management of their greenhouse gas emissions and of risks and opportunities related to the low-carbon transition; and carbon performance, or how companies' carbon performance now and in the future might compare to the international targets and national pledges made as part of the Paris Agreement.

Examples of Frameworks, Standards and Reporting Guidance

TABLE C.1: COMPENDIUM OF FRAMEWORKS, NORMS, AND STANDARDS

Category: Norms/Standards		
Subcategory	Name	Short Description
Definitions/ Principles	Equator Principles (EP)	The Equator Principles (EP) are intended to serve as a common baseline and risk management framework for financial institutions to identify, assess and manage environmental and social risks when financing projects.
Definitions/ Principles	FAST-Infra Sustainable Infrastructure Label	A labelling and taxonomy for sustainable infrastructure assets to enable investors more clarity on assets that align with sustainability targets. The label is broadly aligned with the UN SDGs and G20 Principles for All, introducing 14 baselines and “positive contribution” criteria against four dimensions of sustainability: environmental, social, governance, and adaptation and resilience.
Definitions/ Principles	Operating Principles for Impact Management	The Impact Principles are a framework for investors for the design and implementation of their impact management systems, ensuring that impact considerations are integrated throughout the investment life cycle. They may be implemented through different types of systems, each of which can be designed to fit the needs of an individual organization. The Impact Principles are scalable and relevant to all types of impact investors and sizes of investment portfolios, asset types, sectors, and geographies. They may be adopted at the corporate, line of business, fund, or investment vehicle level. Asset managers with a diverse set of investment products may decide to adopt the principles for only specific funds or vehicles that they consider impact investments and need not adopt the principles for the entirety of their assets.
Definitions/ Principles	Principles for Responsible Investment	The six Principles for Responsible Investment (PRI) are a voluntary and aspirational set of investment principles that offer a menu of possible actions for incorporating ESG factors into investment practices. The principles not only aims to improve understanding of the investment implications of ESG factors but also support investors in incorporating these factors into their investment and ownership decisions. Investors can become signatories to the PRI. They then must report on their responsible investment activities annually.
Definitions/ Principles	QII Principles	The G20 set forth six voluntary, nonbinding principles that provide a strategic direction for infrastructure investment. The QII Principles build on the consensus that infrastructure is a significant driver of economic prosperity and that well-built and sustainable infrastructure maximizes the positive impacts of these high-priced investments.

TABLE C.1: COMPENDIUM OF FRAMEWORKS, NORMS, AND STANDARDS, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Definitions/ Principles	Poseidon Principles	The Poseidon Principles are a global framework for assessing and disclosing the climate alignment of financial institutions' shipping portfolios. They establish a common, global baseline to quantitatively assess and disclose whether financial institutions' lending portfolios are in line with adopted climate goals. Thus, they also serve as an important tool to support responsible decision-making.
Definitions/ Principles	United Nations Global Compact (UNGC)	The United Nations Global Compact is a non-binding United Nations pact to encourage businesses and firms worldwide to adopt sustainable and socially responsible policies, and to report on their implementation. The UN Global Compact is a principle-based framework for businesses, stating 10 principles in the areas of human rights, labor, the environment and anti-corruption. Under the Global Compact, companies are brought together with UN agencies, labor groups and civil society. Cities can join the Global Compact through the Cities Program.
Reporting Guidelines	Climate Bonds Initiative	The Climate Bonds Initiative is an international organization working to mobilize global capital for climate action. It promotes investment in projects and assets necessary for a rapid transition to a low carbon and climate resilient economy. The strategy is to develop a large and liquid green and climate bonds market that will help drive down the cost of capital for climate projects in developed and emerging markets; to grow aggregation mechanisms for fragmented sectors; and to support governments seeking to tap debt capital markets.
Reporting Guidelines	Corporate Sustainability Reporting Directive (CSRD)	EU law requires certain large companies to disclose information on the way they operate and manage social and environmental challenges. This helps investors, civil society organizations, consumers, policy makers and other stakeholders to evaluate the non-financial performance of large companies and encourages these companies to develop a responsible approach to business.
Reporting Guidelines	Global Reporting Initiative Universal and Sector Standards	The GRI Standards enable any organization—large or small, private or public—to understand and report on their impacts on the economy, environment and people in a comparable and credible way, thereby increasing transparency on their contribution to sustainable development. In addition to reporting companies, the standards are highly relevant to many stakeholders, including investors, policy makers, capital markets, and civil society.
Reporting Guidelines	ICMA Green Social and Sustainable Bond Principles	Green bonds enable capital-raising and investment for new and existing projects with environmental benefits. The Green Bond Principles (GBP) seek to support issuers in financing environmentally sound and sustainable projects that foster a net-zero emissions economy and protect the environment. GBP-aligned issuance should provide transparent green credentials alongside an investment opportunity. By recommending that issuers report on the use of green bond proceeds, the GBP principles promote a step change in transparency that facilitates the tracking of funds to environmental projects, while simultaneously aiming to improve insight into their estimated impact.

TABLE C.1: COMPENDIUM OF FRAMEWORKS, NORMS, AND STANDARDS, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Reporting Guidelines	IFC-PS	IFC's Environmental and Social Performance Standards define IFC clients' responsibilities for managing their environmental and social risks. The 2012 edition of IFC's Sustainability Framework, which includes the performance standards, applies to all investment and advisory clients whose projects go through IFC's initial credit review process after January 1, 2012.
Reporting Guidelines	Inclusive Infrastructure and Social Equity	The Reference Tool on Inclusive Infrastructure and Social Equity presents a practical, evidence-based framework for practitioners to maximize the impact of infrastructure investment on reducing inequality and promoting shared prosperity. The disclosure recommendations are structured around four thematic areas that represent core elements of how organizations operate: governance, strategy, risk management, and metrics and targets. These thematic areas are intended to interlink and inform each other.
Reporting Guidelines	Impact Standards for Financing Sustainable Development (IS-FSD)	The standards are a self-assessment tool that aims to help donors and private sector partners improve their development impact focus. By implementing the standards using the supporting guidance note all partners can assess and compare with peers the quality of their impact management process. In particular, they will be able to identify areas in which they are excelling alongside outstanding areas of improvement. This would lead, in the end, to better integration of impact into decision-making, increased impact integrity and better evidence of impact.
Reporting Guidelines	ISSB climate-related disclosures prototype	This document represents recommendations from the Technical Readiness Working Group (TRWG) for consideration by the International Sustainability Standards Board (ISSB) for a climate-related disclosures standard. Although the recommendations build on the established work of the organizations represented on the TRWG, this document has not been subject to the due process of those organizations or the International Financial Reporting Standards (IFRS) Foundation.
Reporting Guidelines	Green Loan Principles, Loan Market Association	The Green Loan Principles (GLP) have been developed by an experienced working party, consisting of representatives from leading financial institutions active in the global syndicated loan markets, with a view to promoting the development and integrity of the green loan product.
Reporting Guidelines	PCAF Global GHG Accounting and Reporting Standard for the Financial Industry	The standard, developed by the Partnership for Carbon Accounting Financials (PCAF) Global Core Team, provides detailed methodological guidance to measure and disclose GHG emissions associated with six asset classes: listed equity and corporate bonds, business loans and unlisted equity, project finance, commercial real estate, mortgages, and motor vehicle loans.

TABLE C.1: COMPENDIUM OF FRAMEWORKS, NORMS, AND STANDARDS, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Reporting Guidelines	SASB Standards for Infrastructure Industries	SASB Standards identify the subset of environmental, social, and governance issues most relevant to financial performance in each of 77 industries. They are designed to help companies disclose financially-material sustainability information to investors. SASB’s rigorous and transparent standard-setting process includes evidence-based research, broad and balanced participation from companies, investors, and subject matter experts, and oversight and approval from an independent standards board. Supporting materials related to the development of the standards are available in a standard-setting archive.
Reporting Guidelines	SuRe	SuRe—the Standard for Sustainable and Resilient Infrastructure—is a third-party-verified, voluntary standard with global outreach. The standard integrates key criteria of sustainability and resilience into infrastructure projects at all development stages and throughout their life cycles. SuRe is based on a multi-stakeholder approach and was developed following the International Social and Environmental Accreditation and Labelling (ISEAL) Alliance guidelines for good practice in standard setting. As such, SuRe is the first infrastructure standard to be an associate member of ISEAL. By integrating governance, social and environmental aspects, SuRe contributes to the incremental achievement of the SDGs.
Reporting Guidelines	Sustainability Accounting Standards	SASB standards are a set of industry-specific standards that identify the subset of ESG issues most important for the sustainability accounting of companies. The standards are designed to enable companies to disclose their financially-material sustainability information to investors in a cost-effective and decision-useful manner. Standards are available for 77 different industries. In the area of infrastructure, standards are available for i) electric utilities and power generators; ii) engineering and construction services; iii) gas utilities and distributors; iv) home builders; v) real estate; vi) real estate services; vii) waste management; and viii) water utilities and services.
Reporting Guidelines	Sustainable Finance Disclosures Regulation (SFDR)	The European Commission adopted technical standards to be used by financial market participants when disclosing sustainability-related information under the Sustainable Finance Disclosures Regulation (SFDR). The Delegated Regulation specifies the exact content, methodology and presentation of the information to be disclosed, thereby improving its quality and comparability. Under these rules, financial market participants will provide detailed information about how they tackle and reduce any possible negative impacts that their investments may have on the environment and society in general. Moreover, these new requirements will help to assess the sustainability performances of financial products. Compliance with sustainability-related disclosures will contribute to strengthening investor protection and reduce greenwashing. This will ultimately support the financial system’s transition towards a more sustainable economy.

TABLE C.1: COMPENDIUM OF FRAMEWORKS, NORMS, AND STANDARDS, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Reporting Guidelines	Taskforce on Nature-related Financial Disclosures	An initiative to bring together a Taskforce on Nature-related Financial Disclosures (TNFD) was announced in July 2020, with the preparatory phase of the initiative running from September 2020 until June 2021. In June 2021, the TNFD formally launched widespread support from financial institutions, corporations, governments and civil society. The G7 Finance Ministers and G20 Sustainable Finance Roadmap have endorsed the TNFD. The G20 and G7 Environment and Climate ministers have also recognized the establishment of the TNFD.
Reporting Guidelines	TCFD guidance on metrics, targets and transition plans	The Financial Stability Board established the TCFD to develop recommendations for more effective climate-related disclosures that could promote more informed investment, credit, and insurance underwriting decisions and, in turn, enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risks.
Reporting Guidelines	SDG Compass	The SDG Compass provides guidance for companies on how they can align their strategies as well as measure and manage their contribution to the realization of the SDGs.
Reporting Guidelines	WEF Stakeholder Capitalism Metrics	The World Economic Forum's International Business Council developed a set of universal, material ESG metrics and recommended disclosures that could be reflected in the mainstream annual reports of companies on a consistent basis across industry sectors and countries.
Safeguards/ Good Practice	2X Challenge	The 2X Challenge was launched at the G7 Summit 2018 as a bold commitment to inspire MDBs/DFIs and the broader private sector to invest in the world's women.
Safeguards/ Good Practice	CEEQUAL	CEEQUAL is the international evidence-based sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and works in public spaces. It aims to assist clients, designers and contractors to deliver improved sustainability performance and strategy in a project or contract, during specification, design and construction. The scheme rewards project and contract teams that go beyond the legal, environmental and social minimums to achieve distinctive environmental and social performance in their work.
Safeguards/ Good Practice	Envision—The Institute for Sustainable Infrastructure (ISI)	The Institute for Sustainable Infrastructure (ISI) is the organization that developed and manages Envision, a framework that encourages systemic changes in the planning, design, and delivery of sustainable, resilient, and equitable civil infrastructure through education, training, and third-party project verification.

TABLE C.1: COMPENDIUM OF FRAMEWORKS, NORMS, AND STANDARDS, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Safeguards/ Good Practice	Equitable Origin (EO) Standard for Responsible Energy	The EO Standard for Responsible Energy is a set of rigorous performance standards for energy development projects that was developed based on consensus from industry, NGOs, affected communities, and government agencies to incentivize excellence in social and environmental performance of energy projects. The standard provides a framework to monitor on-the-ground performance, as well as company-level policies.
Safeguards/ Good Practice	Green Business Certification Inc. (GBCI) Performance Excellence in Electricity Renewal (PEER) Rating System	PEER is the first ever rating system that drives market transformation in the power and energy sectors. Through certification, PEER recognizes industry leaders for improving efficiency, day-to-day reliability and overall resiliency when it comes to severe events, such as flooding and hurricanes. PEER is for all power systems and includes guidance for cities, utilities, campuses and transit.
Safeguards/ Good Practice	Gender Lens Investing Knowledge Hub	The Gender Lens Investing (GLI) Knowledge Hub aims to transfer practitioners' knowhow and enable members to mobilize and allocate capital with a gender lens. Building directly on the findings, resources, and success of the GIIN's GLI Initiative and Working Group, the Knowledge Hub serves and connects all GIIN members, regardless of their prior level of engagement with GLI workstreams and working groups.
Safeguards/ Good Practice	Green Bank Network	The Green Bank Network (GBN) is a membership organization formed to foster collaboration and knowledge exchange among existing Green Banks, enabling them to share best practices and lessons learned. The GBN also aims to serve as a source of knowledge and a network for jurisdictions that seek to establish a Green Bank.
Safeguards/ Good Practice	Hydropower Sustainability Assessment Protocol	The new Hydropower Sustainability Standard offers a comprehensive, evidence-based and transparent methodology to certify hydropower projects for their sustainability performance. Its mission is to create a world where sustainable hydropower is the norm.
Safeguards/ Good Practice	IIGCC's net zero guidance for infrastructure asset class	<p>The guidance covers a range of issues and characteristics often unique to or most pronounced within the infrastructure asset class. This includes their physical nature and direct real-world impact, the breadth of investors engaged with the asset class, the breadth of investment types and long-life-cycle emissions.</p> <p>Specifically, the newly proposed infrastructure guidance covers:</p> <ul style="list-style-type: none"> • Scope of infrastructure assets to be considered for measurement and management as part of a net zero strategy for infrastructure. • Metrics and targets to measure alignment over time. • Implementation actions to achieve alignment targets and decarbonization in the real economy.

TABLE C.1: COMPENDIUM OF FRAMEWORKS, NORMS, AND STANDARDS, CONTINUED

Category: Data/Tools		
Subcategory	Name	Short Description
Safeguards/ Good Practice	JICA Climate Finance Impact Tool (Climate-FIT)	JICA has developed a planning tool with the view of mainstreaming climate change mitigation and adaptation measures into JICA's development projects across sectors.
Safeguards/ Good Practice	People-Centered Accelerator	Sustainable Energy for All (SEforALL) believes in promoting the inclusion of women and the poorest people in society. Alongside efforts to achieve universal access to sustainable energy services, inclusion can help secure a just energy transition that leaves no one behind. SEforALL believes investment in women has a multiplier effect because they reinvest in their communities, and society as a whole benefits.
Safeguards/ Good Practice	Science Based Targets initiative	The Science Based Targets initiative (SBTi) drives ambitious climate action in the private sector by enabling organizations to set science-based emissions reduction targets.
Safeguards/ Good Practice	SDG Impact Standards	The SDG Impact Standards are provided as a best practice guide and self-assessment tool. Organizations can use them to align their internal processes, practices and decision-making. Organizations are encouraged to use the standards in their entirety as a gap analysis and self-assessment tool, and to fill gaps and improve practice over time.
Safeguards/ Good Practice	SDG.imp	With the adoption of the Agenda 2030 and its 17 SDGs by the international community in 2015, the project “Decision-making support system for implementing the goals for sustainable development in protected areas – SDG.imp” will work on achieving these milestones. The aim is to present the SDGs and show approaches on how to implement SDGs in protected areas. For this purpose, the initiative will develop a learning platform and supplementary materials for implementing the SDGs in practice.
Safeguards/ Good Practice	World Bank/GIF Guidance on PPP Contractual Provisions	To harmonize disparate domestic legal regulations and other issues that make standardization challenging to achieve, the World Bank and GIF compiled a set of best practices related to domestic regulatory environments and have issued guidance intended to streamline contracting for infrastructure PPPs. The guidance aims to facilitate the securitization or bundling of distinct infrastructure projects into financial instruments and transform illiquid/risky assets into liquid ones (usually with a larger ticket-size), ultimately helping to increase investor appetite.
Safeguards/ Good Practice	Zero Carbon Building Accelerator	The Zero Carbon Building Accelerator launched in early 2021 in Turkey and Colombia, where WRI and in-country partners, the Colombia Green Building Council and WRI Turkey, are working closely with national and local expert stakeholders from across sectors to identify the transformative actions to build systemic change towards decarbonizing the buildings sector. This project will develop a pipeline of additional cities across the Building Efficiency Accelerator network by leveraging the resulting tools, best practices, and financial solutions.



Bibliography

- Abadie, Richard. 2021. “Global infrastructure trends: Developments in financing.” PwC, 2021. <https://www.pwc.com/gx/en/industries/capital-projects-infrastructure/publications/infrastructure-trends/global-infrastructure-trends-financing.html>.
- ADB (Asian Development Bank). 2009. 42001-013: Philippine Energy Efficiency Project. ADB, January 28, 2009. <https://www.adb.org/projects/42001-013/main>.
- ADB (Asian Development Bank). 2019a. “ADB, DHD Deal to Provide First Large-Scale Floating Solar PV in Viet Nam.” ADB (news release), October 2, 2019. <https://www.adb.org/news/adb-dhd-deal-provide-first-large-scale-floating-solar-pv-viet-nam>.
- ADB (Asian Development Bank). 2019b. India: Scaling Up Demand-Side Energy Efficiency Sector Project (Sovereign Project 52196-001). ADB, November 26, 2019. <https://www.adb.org/projects/52196-001/main>.
- ADB (Asian Development Bank). 2020. “Indonesia Energy Sector Assessment, Strategy, and Road Map—Update.” ADB, Institutional Document, December 28, 2020. <https://www.adb.org/documents/indonesia-energy-assessment-strategy-road-map-update>.
- ADB (Asian Development Bank). 2020. “Riau Natural Gas Power Project: Environmental and Social Monitoring Report (January-June 2020).” <https://www.adb.org/projects/documents/ino-50182-001-esmr-0>.
- ADB (Asian Development Bank). 2021. *Green Jobs for a Resilient Post COVID-19 Economic Recovery*. Video. Manila, Philippines: Asian Development Bank. <https://www.adb.org/news/videos/green-jobs-resilient-post-covid-19-economic-recovery>.
- ADB (Asian Development Bank). 2022. ADB Southeast Asia Innovation Hub: Catalyzing Green and Innovative Finance. <https://www.adb.org/sites/default/files/publication/698271/adb-southeast-asia-innovation-hub-green-finance.pdf>.
- ADB (Asian Development Bank). 2022. “ASEAN Infrastructure Fund.” <https://www.adb.org/what-we-do/funds/asean-infrastructure-fund>.
- ADB (Asian Development Bank). 2022. Indonesia: Sustainable Development Goals Indonesia One — Green Finance Facility (Phase 1). ADB. <https://www.adb.org/projects/54152-001/main>
- ADB (Asian Development Bank). 2022. Uzbekistan: Solid Waste Management Improvement Project. ADB, accessed August 1, 2022. <https://www.adb.org/projects/45366-004/main>.
- ADB (Asian Development Bank). India: Mumbai Metro Rail Systems Project. ADB, accessed August 1, 2022. <https://www.adb.org/projects/49469-007/main>.
- ADB (Asian Development Bank), EBRD (European Bank for Reconstruction and Development), IDB (Inter-American Development Bank), IsDB (Islamic Development Bank), MIF (Multilateral Investment Fund), PPIAF (Public-Private Infrastructure Advisory Facility), and WBG (World Bank Group). 2017. *The PPP Certification Program Guide*. Washington, DC: World Bank. <https://ppp.worldbank.org/public-private-partnership/library/apmg-ppp-certification-guide>.
- ADB (Asian Development Bank), EBRD (European Bank of Reconstruction and Development), GIH (Global Infrastructure Hub), IDB (Inter-American Development Bank), IsDB (Islamic Development Bank), OECD (Organisation for Economic Co-operation and Development), United Nations ESCAP (Economic and Social Commission for Asia and the Pacific), and WBG (World Bank Group). 2017. *PPP Reference Guide 3.0*. Washington, DC: World Bank. <https://ppp.worldbank.org/public-private-partnership/sites/ppp.worldbank.org/files/documents/PPP%20Reference%20Guide%20Version%203.pdf>.

- AfDB (African Development Bank), ADB (Asian Development Bank), AIIB (Asian Infrastructure Investment Bank), EBRD (European Bank for Reconstruction and Development), EIB (European Investment Bank), IDBG (Inter-American Development Bank Group), IsDB (Islamic Development Bank), NDB (New Development Bank) and WBG (World Bank Group). 2021. *2020 Joint Report on Multilateral Development Banks' Climate Finance*. Washington, DC: World Bank. <https://thedocs.worldbank.org/en/doc/9234bfc633439d0172f6a6eb8df1b881-0020012021/original/2020-Joint-MDB-report-on-climate-finance-Report-final-web.pdf>.
- AfDB (African Development Bank), ADB (Asian Development Bank), AIIB (Asian Infrastructure Investment Bank), EBRD (European Bank for Reconstruction and Development), EIB (European Investment Bank), IDBG (Inter-American Development Bank Group), IsDB (Islamic Development Bank), NDB (New Development Bank) and WBG (World Bank Group). 2021. *Common Principles for Climate Mitigation Finance Tracking*. EIB. https://www.eib.org/attachments/documents/mdb_idfc_mitigation_common_principles_en.pdf.
- Africa50. 2018. "Africa50 Invests in Landmark Room2Run US\$1 Billion Securitization Transaction." Africa50 (news release), September 18, 2018. <https://www.africa50.com/news-insights/news/africa50-invests-in-landmark-room2run-us-1-billion-securitization-transaction-240/>
- AIIB (Asian Infrastructure Investment Bank). 2021. *Local Currency Financing*. AIIB, February 26, 2021. https://www.aiib.org/en/treasury/common/download/AIIB_Local-Currency-Financing-PitchBook-Feb2021.pdf
- Alemán, Suárez Ancor, Silva Mariana Zúñiga, and INERCO Consultoría. 2020. *Identificando Mejoras de Eficiencia En La Preparación de Los Componentes Ambientales, Prediales, y Sociales de Las Asociaciones Público-Privadas y Obra Pública Tradicional En América Latina y El Caribe*. Washington, DC: IDB (Inter-American Development Bank). <https://publications.iadb.org/publications/spanish/document/Hacia-una-preparacion-eficiente-y-sostenible-de-proyectos-de-infraestructura.pdf>.
- Amundi. 2022. Update on Green Bond Market. Amundi (product sheet), accessed June 15, 2022. <https://www.amundi.lu/professional/Local-Content/Productsheet/Amundi-Planet-Emerging-Green-One/Amundi-Planet-Emerging-Green-One>.
- Association PRI. 2020. "Bridging the Gap: How Infrastructure Investors Can Contribute to SDG Outcomes." PRI. <https://www.unpri.org/sustainable-development-goals/bridging-the-gap-how-infrastructure-investors-can-contribute-to-sdg-outcomes/6053.article>
- Azhgaliyeva, Dina, and Zhanna Kapsalyamova. 2021. "Policy Support in Promoting Green Bonds in Asia." Asian Development Bank Institute, July 2021. <https://www.adb.org/sites/default/files/publication/726166/adb-1275.pdf>.
- Banco Bradesco. Sustainable Businesses. <https://banco.bradesco/html/classic/sobre/sustentabilidade/en/internas/sustainable-businesses.shtm>.
- Basile, Irene, Valentina Bellesi, Priscilla Boiardi, Weronika Garbacz, and Esme Stout. 2020. "OECD DAC Blended Finance Principle 5: Monitor Blended Finance for Transparency and Results." OECD Guidance Note and Background. https://www.oecd.org/dac/financing-sustainable-development/blended-finance-principles/documents/Principle_5_Guidance_Note_and_Background.pdf
- Bassi, M. Andrea, Ronja Bechauf, Liesbeth Casier, and Emma Cutler. 2021. "How Can Investment in Nature Close the Infrastructure Gap?" Nature-Based Infrastructure Global Resource Centre, IISD (International Institute of Sustainable Development), 2021. <https://nbi.iisd.org/>.
- Bayfront Infrastructure. <https://www.bayfront.sg/platforms>.
- Bayliss, Kate. 2020. "The Use of Development Funds for De-Risking Private Investment: How Effective Is It in Delivering Development?" Policy Department Study, European Parliament Directorate General for External Policies, May 2020. [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/603486/EXPO_STU\(2020\)603486_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/603486/EXPO_STU(2020)603486_EN.pdf).
- Berkeley Energy. Berkeley Energy Funds. <https://www.berkeley-energy.com/energy-funds/>.

- Bhattacharya, Amar, Beatriz Nofal, Linda Krueger, Minji Jeong, and Kevin Gallagher. 2019. "Policy and Institutional Framework for Delivering on Sustainable Infrastructure." G20 Insights, May 2019. <https://www.g20-insights.org/wp-content/uploads/2019/05/t20-japan-tf4-10-policy-institutional-framework-delivering-sustainable-infrastructure.pdf>.
- Bhattacharya, Amar, Cristina Contreras Casado, Minji Jeong, Amal-Lee Amin, Graham Watkins, and Mariana Silva Zuniga. 2019. *Attributes and Framework for Sustainable Infrastructure*. IDB (Inter-American Development Bank). <http://dx.doi.org/10.18235/0001723>.
- BlackRock. 2022. *The History behind the Climate Finance Partnership*. BlackRock, accessed June 30, 2022. <https://www.blackrock.com/institutions/en-us/strategies/alternatives/real-assets/infrastructure/climate-finance-partnership>.
- Blended Finance Taskforce. *INFRA 3.0 Better Finance Better Infrastructure*. Business & Sustainable Development Commission. <https://static1.squarespace.com/static/5acdc066c258b4bd2d15050b/t/5cb46ddc71c10b4ea8d91875/1555328487716/Infra+3.0+FINAL+Taskforce+Spring+Meetings+-+digital.pdf>
- BNDES. 2022. "BNDES Registers Record Net Profit in 2021 and Now Has the Largest Portfolio of Infrastructure Concessions in the World." BNDES (news release), February 25, 2022. https://www.bndes.gov.br/SiteBNDES/bndes/bndes_en/conteudos/noticia/BNDES-registers-record-net-profit-in-2021-and-now-has-the-largest-portfolio-of-infrastructure-concessions-in-the-world/.
- Boffo, Riccardo, Catriona Marshall, and Robert Patalano. 2020. *ESG Investing: Environmental Pillar Scoring and Reporting*. Paris: OECD. <https://www.oecd.org/finance/ESG-Investing-Environmental-Pillar-Scoring-Reporting.pdf>.
- Boiardi, Priscilla, Valentina Bellesi, and Esme Stout. 2022. "OECD DAC Blended Finance Principle 5: Anchor Blended Finance Use to a Development Rationale." OECD Guidance Note and Background. https://www.oecd.org/dac/financing-sustainable-development/blended-finance-principles/documents/Principle_1_Guidance_Note_and_Background.pdf.
- C40 Cities. The C40 Cities Finance Facility. <https://www.c40cff.org/>.
- Castalia. 2021. *Government Asset Recycling: Unlocking Private Capital to Deliver More Infrastructure – Report on Asset Recycling Market Assessment in East Asia for the World Bank*. Washington, D.C: World Bank, 2021.
- CCFLA (Cities Climate Finance Leadership Alliance). Harmonized Application for Project Preparation Facilities. <https://citiesclimatefinance.org/news-and-events/alliance-members-create-harmonized-application-for-project-preparation-facilities/>.
- CCRI (Coalition for Climate Resilient Investment). 2021. *Risk and Resilience: Addressing Physical Climate Risks in Infrastructure Development*. CCRI. https://storage.googleapis.com/wp-static/wp_ccri/6dea3e47-ccri_riskandresilience_26.11.2021.pdf
- CCRI (Coalition for Climate Resilient Investment). <https://resilientinvestment.org/>.
- CDP. CDP Cities' Matchmaker Program. <https://www.cdp.net/en/cities/matchmaker>.
- Climate Bonds Initiative. 2014. Climate Bonds Standard and Certification Scheme. Climate Bonds Initiative, 2014. <https://www.climatebonds.net/standard>.
- Climate Finance Access Network. <https://cfanadvisors.org/>.
- Climate Fund Managers. 2022. Funds. Accessed August 1, 2022. <https://climatefundmanagers.com/funds/#CIO>.
- Coalition for Climate Resilient Investment. <https://resilientinvestment.org/>.
- Conde, Maria Lopez, and Ian Twinn. 2019. *How Artificial Intelligence Is Making Transport Safer, Cleaner, More Reliable and Efficient in Emerging Markets*. IFC. <https://doi.org/10.1596/33387>
- Confindustria. 2021. *B20 Policy Paper Finance & Infrastructure*. Confindustria. https://www.b20italy2021.org/wpcontent/uploads/2021/10/B20_FinanceInfrastructure.pdf

- Convergence. 2021. "Network Voices: What MDBs Can Do to Mobilize Private Capital at Scale." Convergence (blog), November 23, 2021. <https://www.convergence.finance/news-and-events/news/1B8tNYETH80GmihPIFvX7M/view>.
- Convergence. 2021. *The State of Blended Finance 2021*. Convergence. <https://www.convergence.finance/blended-finance>.
- Copernicus. <https://climate.copernicus.eu/climate-data-sustainable-infrastructure>.
- Cordella, Tito. 2018. *Optimizing Finance for Development*. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/29286>.
- CoST (Infrastructure Transparency Initiative). 2022. CoST Guidance. <https://infrastructuretransparency.org/cost-guidance/>.
- Crédit Agricole Securities. 2018. "Project Bonds: Solar." Crédit Agricole Project Bond Focus, June 2018. <https://www.ca-cib.com/sites/default/files/2018-11/Project%20Bond%20Focus%202018%20-%20Solar%20%20FINAL.PDF>.
- CrossBoundary Energy. 2020. "CrossBoundary Energy Fully Exits First Fund at 15% Net IRR, Raises \$40M to Continue to Scale Financed Solar for Businesses in Africa." CrossBoundary (press release), November 17, 2020. https://www.crossboundary.com/wp-content/uploads/2020/11/CBE-Press-Release-20201117_FINAL.pdf.
- CRREM (Carbon Risk Real Estate Monitor). 2020. "Objectives & Benefits." CRREM Project (blog), 2020. <https://www.crrem.eu/objectives-and-benefits/>.
- Cunniff, Shannon, and Aaron Schwartz. 2015. *Performance of Natural Infrastructure and Nature-Based Measures as Coastal Risk Reduction Features*. EDF (Environmental Defense Fund). https://www.edf.org/sites/default/files/summary_ni_literature_compilation_0.pdf
- Curmally, Atiyah, Pratheep Ponraj, Carlos Arias, and Susan Holleran. 2019. "Using artificial intelligence to strengthen E&S risk management." IFC (webinar final presentation), September 2019. https://www.ifc.org/wps/wcm/connect/0cc67c8d-8190-49c6-a84d-0a8957b09d27/Final+Presentation+MALENA_Webinar.pdf?MOD=AJPERES&CVID=mTmbeKJ.
- Dasgupta, Susmita, Somik Lall, and David Wheeler. 2022. "Cutting Global Carbon Emissions: Where Do Cities Stand?" World Bank Blogs, 2022. <https://blogs.worldbank.org/sustainablecities/cutting-global-carbon-emissions-where-do-cities-stand>
- Davidson, Kristiane, Nabilla Gunawan, Monika Filkova, And Amanda Giorgi. 2019. *Infrastructure Investment Opportunities: Indonesia Update Report*. Climate Bonds Initiative. https://www.climatebonds.net/files/reports/giio_indonesia_2019_update_report.pdf
- De Waziers, Benedicte, and Olga Morales. 2020. *How to Integrate a Gender Approach in the Infrastructure Sector?* Infrastructure for Development Special Number No. 2, June 2020, IDB (Inter-American Development Bank). <http://dx.doi.org/10.18235/0002462>
- Del Valle, Clemente. 2016. "The Role of FDN as a Specialized and Innovative Development Bank." FDN (Financiera de Desarrollo Nacional) (presentation). https://g24.org/wp-content/uploads/2016/11/FDN_The-role-of-FDN-as-a-specialized-and-innovative-development-bank.pdf.
- Demôro, Luiza, Sofia Maia, and Felicia Aminoff. 2021. "Climatescope 2021." Energy Transition Factbook, Bloomberg NEF (BNEF), 2021. <https://global-climatescope.org/>.
- Dumond, Susan, and Roma Agrawal. 2022. "AECOM: Skills 2030: Securing the Talent to Build Our Future Infrastructure." AECOM, January 5, 2022. <https://infrastructure.aecom.com/infrastructure-skills>.
- EBRD (European Bank for Reconstruction and Development) and World Bank. "MDB Infrastructure Cooperation Platform: project preparation workstream Phase II reference note on project preparation across the full project cycle." Reference Note, April 2019. https://www.mof.go.jp/english/policy/international_policy/convention/g20/annex6_2.pdf.

- EBRD (European Bank for Reconstruction and Development). 2021. *Cluster Evaluation: Sustainable Infrastructure Operations in Advanced Transition Countries*. London: EBRD. <https://www.ebrd.com/sites/e?c=Content&cid=1395304761281&pagename=EBRD%2FContent%2FDownloadDocument>.
- EBRD (European Bank for Reconstruction and Development). 2021. *Strategy for the Promotion of Gender Equality 2021-2025*. <https://www.ebrd.com/promotion-of-gender-equality-strategy-2021-25.pdf>.
- ECB (European Central Bank). 2022. “Banks Must Get Better at Disclosing Climate Risks, ECB Assessment Shows.” ECB (press release), March 2022. [https://www.bankingsupervision.europa.eu/press/pr/date/2022/html/ssm.pr220314\\$~\\$37303fd463.en.html](https://www.bankingsupervision.europa.eu/press/pr/date/2022/html/ssm.pr220314$~$37303fd463.en.html).
- EDHECinfra. 2021. “Market Inclusion Criteria—The Infrastructure Universe.” EDHECinfra Docs, 2021. <https://docs.edhecinfra.com/display/UN/Market+Inclusion+Criteria>
- EDHECinfra. 2021. *Towards a Scientific Approach to ESG for Infrastructure Investors: Approaching ESG & Infrastructure Within the Portfolio*. EDHECinfra. https://edhec.infrastructure.institute/wp-content/uploads/2021/03/ESG_Approach_Roadmap_2021.pdf
- EDHECinfra. 2022. “Investing Transparently in Infrastructure.” InfraMetricsTM blog, 2022. <https://edhec.infrastructure.institute/>.
- EDHECinfra. Indices and Research. https://edhec.infrastructure.institute/wp-content/uploads/2020/08/EDHECinfra_Indices_Research_low_res.pdf
- EDHECinfra. Unlisted Infrastructure: Research Publications. <https://edhec.infrastructure.institute/research/>.
- EIB (European Investment Bank). 2021. Emerging Market Climate Action Fund (EMCAF). EIB, July 2, 2021. <https://www.eib.org/en/projects/pipelines/all/20200816>.
- EIB (European Investment Bank). 2021. Environmental and Social Data Sheet. EIB, October 13, 2021. <https://www.eib.org/attachments/registers/144297318.pdf>
- EIB (European Investment Bank). 2022. *EIB Project Carbon Footprint Methodologies*. EIB, February 2022. https://www.eib.org/attachments/publications/eib_project_carbon_footprint_methodologies_2022_en.pdf
- Environmental Finance. 2020. “Sustainability Bond of the Year—Bank—Bancolombia.” Environmental Finance, March 30, 2020. <https://www.environmental-finance.com/content/awards/green-social-and-sustainability-bond-awards-2020/winners/sustainability-bond-of-the-year-bank-bancolombia.html>.
- Equal By 30. About the Campaign. <https://www.equalby30.org/en/content/about-campaign>.
- Eriksson, M., and S. Sadat. 2020. *Capacity-Building Needs Assessment to Enhance Financing for Water Infrastructure Projects in Africa*. Stockholm: Stockholm International Water Institute. https://siwi.org/wp-content/uploads/2020/10/aewpp_kp_capacitybuilding_final_web.pdf.
- ESA (European Space Agency). 2020. “EO4SD-Urban—Mission Accomplished!” Earth Observation for Sustainable Development (blog), May 8, 2020. <https://eo4sd-urban.info/eo4sd-urban-mission-accomplished/>.
- ESG Data Convergence Project. https://ilpa.org/ilpa_esg_roadmap/esg_data_convergence_project/.
- ESMAP (Energy Sector Management Assistance Program). <https://www.esmap.org/energy-storage-program>.
- ESMAP (Energy Sector Management Assistance Program). 2020. *Regulatory Indicators for Sustainable Energy (RISE): Sustaining the Momentum*. Washington, DC: World Bank. <https://rise.esmap.org/data/files/reports/rise-renewableenergy.pdf>.
- European Commission, Just Transition Fund. 2022. Accessed July 6, 2022. https://ec.europa.eu/info/funding-tenders/find-funding/eu-funding-programmes/just-transition-fund_en.

- European Commission. 2018. Regulation on Sustainability-Related Disclosure in the Financial Services Sector. Brussels: European Commission, April 2018. https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/sustainability-related-disclosure-financial-services-sector_en.
- European Commission.. EU Taxonomy for Sustainable Activities.” https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en
- FAST-Infra. 2021. FAST-Infra Sustainable Infrastructure Label: Dimensions & Criteria Indicators. https://www.climatepolicyinitiative.org/wp-content/uploads/2021/11/FAST-Infra-SI-Dimensions-and-Criteria-Indicators_FINAL-161221.pdf
- Fatica, Serena, and Roberto Panzica. 2021. “Green Bonds as a Tool against Climate Change?” Business Strategy and the Environment 30 (5)
- Fell, Jessica, and Kristy Carden. 2022. “Lessons from the Cape Town Water Crisis and the Need for a Renewed Technical Agenda.” Brookings Institution (blog), March 30, 2022. <https://www.brookings.edu/blog/africa-in-focus/2022/03/30/lessons-from-the-cape-town-water-crisis-and-the-need-for-a-renewed-technical-agenda/>.
- Finance in Common. 2021. *PDBs in Action: Progress Report from the First Year of Life of the Finance in Common Coalition*. Finance in Common. https://financeincommon.org/sites/default/files/2021-10/Progress%20Report%20from%20the%20First%20Year%20of%20Life%20of%20the%20Finance%20in%20Common%20Coalition_1.pdf.
- Finlayson, Bob. 2018. *Thematic Evaluation: Infrastructure Project Preparation Facility (IPPF)*. London: European Bank for Reconstruction and Development. <https://www.ebrd.com/documents/evaluation/evaluation-infrastructure-project-preperation.pdf>.
- Fioravanti, Reinaldo, Carolina Lembo, and Akash Deep. 2019. *Filling the Infrastructure Investment Gap: The Role of Project Preparation and Structuring Facilities*. Washington, DC: IDB (Inter-American Development Bank). <https://doi.org/10.18235/0001590>.
- G20 (Group of 20). 2015. Partnering to Build a Better World: MDBs’ Common Approaches to Supporting Infrastructure Development. G20, September 2015. <http://g20.org.tr/wp-content/uploads/2015/11/Paper-on-MDB-Common-Approaches-to-Supporting-Infrastructure-Development.pdf>.
- G20 (Group of 20). 2019. G20 Principles for Quality Infrastructure Investment. Ministry of Finance Japan, Osaka. https://www.mof.go.jp/english/policy/international_policy/convention/g20/annex6_1.pdf.
- G20 International Financial Architecture Working Group. 2020. *The G20 Reference Framework for Effective Country Platforms*. G20 International Financial Architecture Working Group. <http://www.mof.gov.cn/en/Cooperation/mulid/202011/P020201104581749367491.pdf>
- G20 Italia. 2021. “Fourth G20 Finance Ministers and Central Bank Governors Meeting.” Communiqué, October 13, 2021. https://www.mof.go.jp/english/policy/international_policy/convention/g20/g20_20211013.pdf
- Gaidarenko, Nataliia, Abhishek Gupta, and Alice James. 2022. “Evolution of Unlisted Infrastructure Investments and the Way Forward.” GIH. <https://www.gihub.org/articles/evolution-of-unlisted-infrastructure-investments-and-the-way-forward/>.
- Gaidarenko, Nataliia, Abhishek Gupta, and Alice James. 2022. “Evolution of unlisted infrastructure investments and the way forward.” GIH (Global infrastructure Hub) (news release, March 18, 2022. <https://www.gihub.org/articles/evolution-of-unlisted-infrastructure-investments-and-the-way-forward/>.
- GEFF (Green Economy Financing Facility). Facilities, Green Economy Financing, European Bank Reconstruction, and Development. <https://ebrdgeff.com/about-seff/>.
- GFANZ (Glasgow Financial Alliance for Net Zero). <https://www.gfanzero.com/>.
- GFANZ (Glasgow Financial Alliance Net Zero). 2022. *Recommendations and Guidance: Financial Institution Net-zero Transition Plans*. GFANZ. https://assets.bbhub.io/company/sites/63/2022/06/GFANZ_Recommendations-and-Guidance-on-Net-zero-Transition-Plans-for-the-Financial-Sector_June2022.pdf

- GIB (Global Infrastructure Basel) Foundation <https://gib-foundation.org/the-standard-for-sustainable-and-resilient-infrastructure-sure/>.
- GIF (Global Infrastructure Facility). 2021. “Unlocking Private Climate Finance in Emerging Markets Private Sector Considerations for Policymakers.” Global Infrastructure Facility, Climate Finance Leadership Initiative, April 2021. <https://www.globalinfrafacility.org/sites/gif/files/2021-04/Private-Sector-Considerations-for-Policymakers-Final.pdf>.
- GIF (Global Infrastructure Facility). Projects. <https://www.globalinfrafacility.org/projects?#>.
- GIH (Global Infrastructure Hub) and CRISIL Risk and Infrastructure Solutions Limited. 2019. *Leading Practices in Governmental Processes Facilitating Infrastructure Project Preparation: A practical guide for governments, informed by a country-lens review of leading practices*. GIH. https://cdn.gihub.org/umbraco/media/2344/gih_project-preparation_full-document_final_art_web.pdf.
- GIH (Global Infrastructure Hub). 2019. *Leading Practices in Governmental Processes Facilitating Infrastructure Project Preparation*. 2019. https://cdn.gihub.org/umbraco/media/2344/gih_project-preparation_full-document_final_art_web.pdf.
- GIH (Global Infrastructure Hub). 2019. *Leading Practices in Governmental Processes Facilitating Infrastructure Project Preparation*. <https://www.gihub.org/resources/publications/leading-practices-in-governmental-processes-facilitating-infrastructure-project-preparation/>.
- GIH (Global Infrastructure Hub). 2020. *InfraCompass*. GIH. <https://content.gihub.org/live/media/2114/infracompass-2020-report-web-optimised.pdf>.
- GIH (Global Infrastructure Hub). 2020. *Infrastructure Monitor 2020*. GIH. https://www.gihub.org/infrastructure-monitor/?utm_source=peremail&utm_medium=email&utm_campaign=IM-launch.
- GIH (Global Infrastructure Hub). 2020. “Unpacking complexity to provide solutions for funding and financing of infrastructure.” GIH Infrastructure Working Group Reference Note, 2020. <https://cdn.gihub.org/umbraco/media/3712/g20-infrastructure-working-group-reference-note-funding-and-financing-of-infrastructure.pdf>
- GIH (Global Infrastructure Hub). 2021. “Performance in Each Driver.” G20 Initiative, 2021. <https://infracompass.gihub.org/insights/performance-in-each-driver/>.
- GIH (Global Infrastructure Hub). 2021. *Infrastructure Monitor 2021*. GIH. <https://www.gihub.org/infrastructure-monitor/>.
- GIIN (Global Impact Investing Network). 2020. *2020 Annual Impact Investor Survey*. GIIN. <https://thegiin.org/research/publication/impinv-survey-2020>
- Gillam, Ross. 2022. “Net Zero Guidance for Infrastructure Asset Class Launched by IIGCC.” IIGCC Blog, 2022. <https://www.iigcc.org/news/net-zero-guidance-for-infrastructure-asset-class-launched-by-iigcc/>.
- GINN. IRIS+ System | Standards. <https://iris.thegiin.org/standards/>.
- GISD (Global Investors for Sustainable Development) Alliance. <https://www.gisdalliance.org/>.
- Global Emerging Markets Risk Database Consortium. <https://www.gemsriskdatabase.org/>.
- Government of Hong Kong SAR (Special Administrative Region). 2018. “Government Launches Green Bond Grant Scheme.” Hong Kong SAR (news release), June 15, 2018. <https://www.info.gov.hk/gia/general/201806/15/P2018061500373.htm>.
- Government of Peru. 2019. *Plan Nacional de Infraestructura para la Competitividad*. Government of Peru. https://www.mef.gob.pe/contenidos/inv_privada/planes/PNIC_2019.pdf.
- Green Fiscal Policy Network. 2021. “Role of Fiscal Policies in a Green COVID-19 Recovery: Experience, Best Practice and Next Steps in the Asia-Pacific Region.” Green Fiscal Policy Network, December 2021. <https://greenfiscalspolicy.org/role-of-fiscal-policies-in-a-green-covid-19-recovery-experience-best-practice-and-next-steps-in-the-asia-pacific-region/>.

- Green Fiscal Policy Network. 2022. <https://greenfiscalspolicy.org/>.
- GRESB. <https://www.gresb.com/nl-en/industry-insights/resources/>.
- Gridworks Development Partners. <https://gridworkspartners.com>.
- GuarantCo. 2020. "London Stock Exchange Welcomes Its First Kenya Shilling Corporate Bond on the ISM, Acorn Holdings, Guaranteed by GuarantCo, to Finance Clean, Safe, Affordable and Green-Certified Accommodation for 5,000 Students in Nairobi." Guarantco (news release), January 2020. <https://guarantco.com/news/london-stock-exchange-welcomes-its-first-kenya-shilling-corporate-bond-on-the-ism-acorn-holdings-guaranteed-by-guarantco-to-finance-clean-safe-affordable-and-green-certified-accommodation-for-50/>.
- Hallegatte, Stephane, and Nathan L. Engle. 2019. "The Search for the Perfect Indicator: Reflections on Monitoring and Evaluation of Resilience for Improved Climate Risk Management." *Climate Risk Management* 23, (2019): 1-6. <https://doi.org/10.1016/j.crm.2018.12.001>.
- Hallegatte, Stephane, Jun Rentschler, and Julie Rozenberg. 2019. *Lifelines: The Resilient Infrastructure Opportunity*. Washington, DC: World Bank. <https://doi.org/10.1596/978-1-4648-1430-3>.
- Hallegatte, Stephane, Jun Rentschler, Julie Rozenberg, Clive Harris, Jyoti Bisbey, Lori Kerr, James Markland, Said Dahdah, Pierre Lorillou, and Christoph Klaiber. 2021 *Well Maintained: Economic Benefits from More Reliable and Resilient Infrastructure*. Washington, DC: World Bank. https://www.globalinfrastructure.org/sites/gif/files/2021-07/Well_Maintained_Economic_Benefits_WB_G20_Report_.pdf.
- HIPSO (Harmonized Indicators for Private Sector Operations Group). <https://indicators.ifipartnership.org/>.
- Hu, Zhen, and William Perraudin. 2020. *Client Report: Infrastructure Debt Capital Charges for Insurers*. Risk Control Limited, November 2020. <https://www.riskcontrollimited.com/insights/infrastructure-debt-capital-charges-for-insurers/>.
- Hub Energia. 2020. Data | IADB. Hub de energia America Latina Y EL Caride, 2020. <https://hubenergia.org/en/data>.
- ICLEI (International Council for Local Environmental Initiatives). Transformative Actions Program. <https://tap-potential.org/>.
- ICMA (International Capital Market Association). 2021. *Social Bond Principles (SBP)*. ICMA Group. <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/social-bond-principles-sbp/>.
- IDB (Inter-American Development Bank) Invest. 2018. *What Is Sustainable Infrastructure? A Framework to Guide Sustainability Across the Project Cycle*. IDB. <http://dx.doi.org/10.18235/0001043>
- IDB (Inter-American Development Bank). 2019. "IDB Invest Finances the Mar 1 Highway in Colombia to Improve the Country's Road Connectivity." IDB (news release), March 2019. <https://www.idbinvest.org/en/news-media/idb-invest-finances-mar-1-highway-colombia-improve-countrys-road-connectivity>.
- IDB (Inter-American Development Bank). 2020. *MDB Infrastructure Cooperation Platform: A Common Set of Aligned Sustainable Infrastructure Indicators SII*. IDB. <https://doi.org/10.18235/0002657>
- IDB (Inter-American Development Bank). 2022. *Climate Resilient PPPs: Toolkits for Infrastructure PPPs*. <https://publications.iadb.org/publications/english/document/Climate-Resilient-Public-Private-Partnerships-A-Toolkit-for-Decision-Makers.pdf>.
- IEA (International Energy Agency). 2021. *Empowering Cities for a Net Zero Future*. <https://www.iea.org/reports/empowering-cities-for-a-net-zero-future>.
- IFC (International Finance Corporation) Climate Business Department. 2017. *IFC's Definitions and Metrics for Climate-Related Activities; Version 3.1*. IFC, April 2017. <https://www.ifc.org/wps/wcm/connect/8ebdc507-a9f1-4b00-9468-7b4465806ecd/IFC+Climate+Definitions+v3.1+.pdf?MOD=AJPERES&CVID=IQuLLhw>.

- IFC (International Finance Corporation), as the Secretariat of the Sustainable Banking Network (SBN) and the Climate Bonds Initiative (CBI) for the SBN Green Bond Working Group. 2018. *Creating Green Bond Markets – Insights, Innovations, and Tools from Emerging Markets*. October 2018. https://sbfnetwork.org/wp-content/uploads/pdfs/Creating_Green_Bond_Markets/SBN_Creating_Green_Bond_Markets_Report_2018.pdf.
- IFC (International Finance Corporation). 2018. “Private Equity and Venture Capital’s Role in Catalyzing Sustainable Investment.” IFC. https://www.ifcamc.org/sites/amc/files/G20%20Input%20Paper_%202018.pdf.
- IFC (International Finance Corporation). 2019. “AIMM (Anticipated Impact, Measurement & Monitoring) Sector Framework Brief: Power.” IFC, March 2019. <https://www.ifc.org/wps/wcm/connect/9f89e8f3-62fd-4af0-9c23-3c59f74a2630/AIMM-Power-Consultation.pdf?MOD=AJPERES&CVID=nmTfdlr>.
- IFC (International Finance Corporation). 2020. *Emerging Market Green Bonds Report 2020*. IFC. <https://www.ifc.org/wps/wcm/connect/0fab2dcd-25c9-48cd-b9a8-d6cc4901066e/2021.04+-+Emerging+Market+Green+Bonds+Report+2020+-+EN.pdf?MOD=AJPERES&CVID=nBW.6AT>.
- IFC (International Finance Corporation). 2020. *Growing Impact: New Insights into the Practice of Impact Investing*. IFC. <https://www.ifc.org/wps/wcm/connect/8b8a0e92-6a8d-4df5-9db4-c888888b464e/2020-Growing-Impact.pdf?MOD=AJPERES&CVID=naZEst9>
- IFC (International Finance Corporation). 2021. *A Green Reboot for Emerging Markets—Key Sectors for Post-COVID Sustainable Growth*. Washington, DC: International Finance Corporation. https://www.ifc.org/wps/wcm/connect/79ef3830-ff20-4430-ad10-c0cf01e93a42/IFC_GreenReport_FINAL_web_1-14-21.pdf?MOD=AJPERES&CVID=nsISBiN.
- IFC (International Finance Corporation). 2022. *Guidelines for Blue Finance: Guidance for Financing the Blue Economy, Building on the Green Bond Principles and the Green Loan Principles*. Washington, DC: IFC. <https://www.ifc.org/wps/wcm/connect/cdbfb6c5-2726-47a6-9374-6a6f86032dd4/IFC-guidelines-for-blue-finance.pdf?MOD=AJPERES&CVID=nWxsyxN>.
- IFC (International Finance Corporation). 2022. UK-IFC Market Accelerator for Green Construction. https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/BF/Focus-Areas/bf-climate/magc.
- IFC (International Finance Corporation). MCPP Infrastructure. IFC (presentation). <https://www.ifc.org/wps/wcm/connect/4c9e0868-1232-4212-b4f2-a5c39d177afa/MCPP+Infrastructure+Flyer+2018.pdf?MOD=AJPERES&CVID=mcoa4bt>.
- IFC (International Finance Corporation). Summary of Investment Information, Riau IPP. <https://disclosures.ifc.org/project-detail/SII/39879/riau-ipp>.
- IFC. 2021. “IFC Invests in Egypt’s First Private Sector Green Bond to Help Boost Climate Finance, Drive Green Growth.” IFC (press release), August 3, 2021. <https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=26548>.
- IJ Global. 2020. “Infrastructure Journal and Project Finance Magazine.” <https://www.ijglobal.com/data>.
- IMF (International Monetary Fund). 2021. “Strengthening Infrastructure Governance for Climate-Responsive Public Investment.” IMF Policy Paper, December 22, 2021. <https://www.imf.org/en/Publications/Policy-Papers/Issues/2021/12/22/Strengthening-Infrastructure-Governance-for-Climate-Responsive-Public-Investment-511258>.
- IMF (International Monetary Fund). 2022. *World Economic Outlook: War Sets Back the Global Recovery*. Washington, DC: IMF. <https://www.imf.org/en/Publications/WEO/Issues/2022/04/19/world-economic-outlook-april-2022>.
- Infraclear. <https://infraclear.com/>.
- Infratam. 2021. “Data on Public Investment in Economic and Infrastructure in Latin America and the Caribbean.” Infratam Blog, 2021. <http://infratam.info/en/home/>.
- Infrastructure Australia. 2021. 2021 Australian Infrastructure Plan. Infrastructure Australia, September 2021. <https://www.infrastructureaustralia.gov.au/publications/2021-australian-infrastructure-plan>.

- Inter-American Development Bank (IDB). 2017. "IDB Invest Finances La Castellana Wind Project to Diversify Argentina's Energy Matrix." IDB (news release), November 27, 2017. <https://www.iadb.org/en/news/idb-invest-finances-la-castellana-wind-project-diversify-argentinas-energy-matrix>.
- IPSF (International Platform on Sustainable Finance). 2021. *Common Ground Taxonomy–Climate Change Mitigation: Instruction Report*. IPSF. https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/211104-ipsf-common-ground-taxonomy-instruction-report-2021_en.pdf.
- IRENA (International Renewable Energy Agency). Data & Statistics. <https://www.irena.org/Statistics>.
- Jaramillo, Andrea. 2021. "Colombia Taps Local Green Bond Market Again to Meet ESG Demand." Bloomberg, October 19, 2021. <https://www.bloomberg.com/news/articles/2021-10-19/colombia-taps-local-green-bond-market-again-to-meet-esg-demand>.
- JICA (Japan International Cooperation Agency). 2018. "Launching the G7 2X Challenge: Financing for Women with Development Finance Institutions from G7 Countries." JICA (press release), June 11, 2018. https://www.jica.go.jp/english/news/press/2018/180611_01.html.
- Jobst, A. 2018. *Credit Risk Dynamics of Infrastructure Investment: Considerations for Financial Regulators*. Washington, DC: World Bank. <https://dx.doi.org/10.2139/ssrn.3152977>.
- Joint Committee of the European Supervisory Authorities Securities and Markets Stakeholder Group. 2021. *Final Report on Draft Regulatory Technical Standards*. https://www.esma.europa.eu/sites/default/files/library/jc_2021_03_joint_esas_final_report_on_rts_under_sldr.pdf
- Jordan-Tank, Matthew, and Vamsee Kanci. 2017. "Success Factors in Turkey's Elaziğ Healthcare PPP." World Bank Blogs, 2017. <https://blogs.worldbank.org/ppps/success-factors-turkey-s-elazi-healthcare-ppp>.
- Kelhoffer, Kelvin. 2020. "Moody's Analytics Data Alliance Project Finance Consortium Helps World Bank Group Achieve Its Strategic Objectives." Moody's Analytics, 2020. <https://www.moodyanalytics.com/articles/2020/data-alliance-world-bank>.
- Kumar, Manmohan S. et al. 2021. "Investing in Emerging and Frontier Economies: How Blended Finance can make the most of public funding." ILN (Investor Leadership Network) Position Paper for COP26 and G20, October 2021. <https://investorleadershipnetwork.org/en/resource/blended-finance-blueprint/>.
- Lab México. 2021. *Apoyo a la implementación de la transición energética en México*. Laboratorio de Innovación Financiera, Lab México. <https://www.labmexico.com/wp-content/uploads/2022/04/HojadeRuta-Financiamiento-GSD.pdf>
- Larrea, Joan. 2021. "Five critiques of blended finance – and five responses from Convergence." Convergence (blog), August 17, 2021. <https://www.convergence.finance/news-and-events/news/7DQVQeR4TfDLLqbsysz8/view>.
- Leaders of the G7 (Group of Seven). 2022. "G7 Leaders' Communiqué." G7, Elmau, June 28, 2022. <https://www.consilium.europa.eu/media/57555/2022-06-28-leaders-communicue-data.pdf>
- McKinsey & Company. 2019. "Unlocking Private-Sector Financing in Emerging-Markets Infrastructure." McKinsey & Company, October 10, 2019. <https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/unlocking-private-sector-financing-in-emerging-markets-infrastructure>.
- McKinsey Global Institute. 2017. "Bridging infrastructure gaps: Has the world made progress?" McKinsey (blog), October 13, 2017. <https://www.mckinsey.com/business-functions/operations/our-insights/bridging-infrastructure-gaps-has-the-world-made-progress>.
- Mexico Projects Hub. Infrastructure and Energy Projects Open to Private Equity. Accessed May 15, 2022. <https://www.proyectosmexico.gob.mx/>.
- MIT Sloan School of Management. 2022. "The Aggregate Confusion Project." MIT. <https://mitsloan.mit.edu/sustainability-initiative/aggregate-confusion-project>

- Monetary Authority of Singapore. Sustainable Bond Grant Scheme. <https://www.mas.gov.sg/schemes-and-initiatives/sustainable-bond-grant-scheme>.
- Moody's Analytics. 2018. Data Alliance. Moody's Analytics (product list). <https://www.moodyanalytics.com/product-list/data-alliance>.
- Moody's Investors Service. 2020. "Research: Moody's: Sustainable Project Finance Bank Loans Demonstrate Lower Default Risk." Moody's Investors Service (news release), August 17, 2020. https://www.moody.com/research/Moodys-Sustainable-project-finance-bank-loans-demonstrate-lower-default-risk-PBC_1241719
- Murray, Alex. 2020. "Future of Alternatives 2025: Laying the Foundations for Infrastructure Growth." Prequin (blog), 2020. <https://www.prequin.com/insights/research/blogs/laying-the-foundations-for-infrastructure-growth#:~:text=Prequin%20forecasts%20that%20unlisted%20infrastructure>
- Nassiry, Darius, Sam Pickard, Shelagh Whitley, and Andrew Scott. 2021. *Clean Energy Project Preparation Facilities: Mapping Global Landscape*. London: Overseas Development Institute. <https://cdn.odi.org/media/documents/12504.pdf>.
- National Investment & Infrastructure Fund. Media Releases. https://www.niifindia.in/media_releases.
- Nicoletti, Elizabeth. 2020. "What is a B-bond?" IDB Invest (blog), August 14, 2020. <https://idbinvest.org/en/blog/financial-institutions/what-b-bond>.
- O'Callaghan, Brian J., and Em Murdock. 2021. *Are We Building Back Better? Evidence from 2020 and Pathways to Inclusive Green Recovery Spending—Summary for Policymakers*. United Nations Environment Programme (UNEP), 2021. <https://www.unep.org/resources/publication/are-we-building-back-better-evidence-2020-and-pathways-inclusive-green>.
- Oberholzer, Basel, Katharina Schneider-Roos, Charlotte Boulanger, and Maryke Staden. 2018. *Summary of Good Practice of Successful Project Preparation Facilities*. CCFLA (City Climate Finance Leadership Alliance), ICLEI World Congress, June 2018. <https://worldcongress2018.iclei.org/wp-content/uploads/Summary-of-good-practice-of-successful-project-preparation-facilities.pdf>.
- OECD (Organisation for Economic Co-operation and Development). 2021. Transport - Infrastructure Investment - OECD Data. <http://data.oecd.org/transport/infrastructure-investment.htm>.
- OECD (Organisation for Economic Co-operation and Development). 2021. *Pension Markets in Focus 2021*. Paris: OECD. <https://www.oecd.org/daf/fin/private-pensions/Pension-Markets-in-Focus-2021.pdf>.
- OECD (Organisation for Economic Co-operation and Development). 2019. "Sustainable Connectivity: Closing the Gender Gap in Infrastructure." OECD Environment Policy Papers, No. 15, 2019. https://www.oecd-ilibrary.org/environment/sustainable-connectivity_6350ba66-en.
- OECD (Organisation for Economic Co-operation and Development). 2017. *Getting Infrastructure Right: A Framework for Better Governance*. Paris: OECD. <https://www.oecd.org/publications/getting-infrastructure-right-9789264272453-en.htm>.
- OECD (Organisation for Economic Co-operation and Development). 2017. *Investing in Climate, Investing in Growth*. Paris: OECD. <https://doi.org/10.1787/9789264273528-en>.
- OECD (Organisation for Economic Co-operation and Development). 2018. *OECD DAC Blended Finance Principles for Unlocking Commercial Finance for the Sustainable Development Goals*. Paris: OECD. <https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/OECD-Blended-Finance-Principles.pdf>.
- OECD (Organisation for Economic Co-operation and Development). 2020. *Developing Sustainable Finance Definitions and Taxonomies, Green Finance and Investment*. Paris: OECD. <https://doi.org/10.1787/134a2dbe-en>
- OECD (Organisation for Economic Co-operation and Development). 2021. *OECD Implementation Handbook for Quality Infrastructure Investment: Supporting a Sustainable Recovery from the COVID-19 Crisis*. Paris: OECD. <https://www.oecd.org/finance/OECD-ImplementationHandbook-for-Quality-Infrastructure-Investment.htm>.

- OECD (Organisation for Economic Co-operation and Development). 2020. *Green Infrastructure in the Decade for Delivery: Assessing Institutional Investment, Green Finance and Investment*. Paris: OECD. <https://doi.org/10.1787/f51f9256-en>.
- OECD (Organisation for Economic Co-operation and Development). 2020. "Recommendation of the Council on the Governance of Infrastructure." OECD (legal instruments), July 16, 2020, <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0460#mainText>.
- OECD (Organisation for Economic Co-operation and Development). 2020. *G20/OECD Report on the Collaboration with Institutional Investors and Asset Managers on Infrastructure: Investor Proposals and the Way Forward*. Paris: OECD. <https://www.oecd.org/finance/g20-collaboration-with-institutional-investors-and-asset-managers-on-infrastructure.htm>.
- OECD (Organisation for Economic Co-operation and Development). 2019. "Gender Equality and Sustainable Infrastructure." OECD Council on the SDGs, Issues Note, March 7, 2019, Paris. <https://www.oecd.org/gov/gender-mainstreaming/gender-equality-and-sustainable-infrastructure-7-march-2019.pdf>.
- OECD (Organisation for Economic Co-operation and Development). 2017. "Supporting the Infrastructure Data Initiative – Summary of the Workshop on Infrastructure as an Asset Class and Data Collection for Longterm Investment." OECD, November 2017, Paris. <https://www.oecd.org/daf/fin/private-pensions/Workshop-on-Infrastructure-Data-Collection-LTI-2017-Summary.pdf>.
- OECD (Organisation for Economic Co-operation and Development). Infrastructure Investment. <https://www.oecd.org/g20/topics/infrastructure/>.
- OECD (Organisation for Economic Co-operation and Development). Sustainable Infrastructure Policy Initiative. OECD. <https://www.oecd.org/finance/Sustainable-Infrastructure-Policy-Initiative.pdf>
- OECD (Organisation for Economic Co-operation and Development). 2022. Strategic Policies for Sustainable Infrastructure Initiative. Accessed July 6, 2022. <https://www.oecd.org/finance/sustainable-infrastructure.htm>.
- OECD (Organisation for Economic Co-operation and Development). 2020. OECD Compendium of Policy Good Practices for Quality Infrastructure. OECD, November 2, 2020. <https://www.oecd.org/finance/oecd-compendium-of-policy-good-practices-for-quality-infrastructure-investment.htm>.
- OECD (Organisation of Economic Co-operation and Development) and World Bank Group. 2015. *Risk and Return Characteristics of Infrastructure Investment in Low Income Countries*. Paris: OECD. <https://www.oecd.org/g20/topics/development/Report-on-Risk-and-Return-Characteristics-of-Infrastructure-Investment-in-Low-Income-Countries.pdf>.
- One Planet Lab. 2021. *Blended finance for scaling up climate and nature investments*. November 2021. <https://www.oneplanetsummit.fr/sites/default/files/202111/Blended%20Finance%20for%20Scaling%20Up%20Climate%20and%20Nature%20Investments%2C%20November%202021.pdf>
- Operating Principles for Impact Management. The 9 Principles. <https://www.impactprinciples.org/9-principles>.
- Oxford Policy Management. 2020. *Comparative Analysis of IFIs and DFIs Impact Measurement and Project Assessment Tools*. https://static1.squarespace.com/static/58c7012786e6c06ad0252441/t/6041bcabbbcd3b44563b337c/1614920884726/201125_OPM_DFI+ex-ante+impact+assessment+tools+comparison.pdf
- Partnership for Carbon Accounting Financials. 2022. Financial Institutions Taking Action. Accessed August 1, 2022. <https://carbonaccountingfinancials.com/financial-institutions-taking-action>.
- PBOC (People's Bank of China). 2021. *Catalogue of Green Bond Endorsed Projects (2021 Edition)*. <http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4342400/2021091617180089879.pdf>.
- PIDG (Private Infrastructure Development Group). 2021. *Annual Review*. <https://www.pidg.org/wp-content/uploads/2022/06/PIDG-AR2021-Final.pdf#page=44>.

- PIDG (Private Infrastructure Development Group). 2021. Gender Equity Action Plan 2021, Private Infrastructure Development Group. <https://www.pidg.org/about-us/our-strategy/pidg-gender-equity-action-plan/>.
- PPIAF (Public-Private Infrastructure Advisory Facility). 2022. The Climate Resilience & Environmental Sustainability Technical Advisory (CREST). Accessed July 6, 2022. <https://ppiaf.org/program/climate-resilience-environmental-sustainability-technical-advisory-crest>.
- PPIAF (Public-Private Infrastructure Advisory Facility) and World Bank Group. 2022. *COVID-19 and Public-Private Partnerships Practice: Assessing the Impact of COVID-19 on PPP Pipelines and Projects in Preparation*.
- Preqin. 2020. *2020 Preqin Global Infrastructure Report*. Preqin. <https://www.preqin.com/insights/global-reports/2020-preqin-global-infrastructure-report>.
- PRI (Principles for Responsible Investment). 2018. *Primer on Responsible Investment in Infrastructure*. PRI. <https://www.unpri.org/download?ac=4141>.
- PRI (Principles for Responsible Investment). 2022. "Closing the funding gap: The case for ESG incorporation and sustainability outcomes in emerging markets." PRI (blog), April 5, 2022. <https://www.unpri.org/sustainable-development-goals/closing-the-funding-gap-the-case-for-esg-incorporation-and-sustainability-outcomes-in-emerging-markets/9430.article>.
- ProInversión, Government of Peru Ministry of Foreign Affairs, and EY. 2020. *Peru's Infrastructure Investment Guide 2020/2021*. https://assets.ey.com/content/dam/ey-sites/ey-com/es_pe/topics/infrastructure/ey-perus-infrastructure-investment-guide.pdf?download
- Refinitiv. "Infrastructure 360 App: Insights on global infrastructure developments from ideation to completion." Refinitiv. https://www.refinitiv.com/content/dam/marketing/en_us/documents/brochures/infrastructure-360-brochure.pdf.
- Refinitiv. 2020. *Global Project Finance Review*. Refinitiv. <https://thesource.refinitiv.com/TheSource/getfile/download/b75a2ed9-d685-492c-b3d4-c24a5cf5d4f3>.
- Reino, Juan Luis Gómez. 2021. *Experiencia Internacional en el reciclaje de activos de infraestructura pública: estudios de caso impactos y lecciones aprendidas*. IDB (Inter-American Development Bank). <https://publications.iadb.org/publications/spanish/document/Experiencia-internacional-en-el-reciclaje-de-activos-de-infraestructura-publica-estudios-de-caso-impactos-y-lecciones-aprendidas.pdf>.
- Resilience Shift. <https://www.resilienceshift.org/tools/>.
- Rigout, F.C., C. Sanche, R.C. Antoniazzi, A. Skackauskas, J. Daminelli, P. Gill, and R. Rosemberg. 2020. *Street Lighting Impacts in Brazil—Final Report*. GIF (Global Infrastructure Facility). <https://www.globalinfrafacility.org/knowledge/street-lighting-impacts-brazil-final-report>.
- Risk Control Limited. 2020. *Infrastructure Debt Capital Charges for Insurers*. Risk Control Limited Client Report. London: GIH. <https://www.riskcontrollimited.com/wp-content/uploads/2020/11/Infrastructure-Debt-Capital-Charges-for-Insurers-20-125a-04-11-20-v40-1.pdf>.
- Rosemberg, Cristina, Xavier Potau, Samuel Leistner, Felix Dijkstal, Aaron Vinnik, Costanza Tiriduzzi, Anoushka Daved, and Knut Blind. 2020. *Regulatory Sandboxes and Innovation Testbeds: A Look at International Experience in Latin America and the Caribbean*. Washington, DC: IDB (Inter-American Development Bank). <https://publications.iadb.org/publications/english/document/Regulatory-Sandboxes-and-Innovation-Testbeds-A-Look-at-International-Experience-in-Latin-America-and-the-Caribbean.pdf>.
- Rozenberg, Julie, and Marianne Fay. 2019. *Beyond the Gap: How Countries Can Afford the Infrastructure They Need while Protecting the Planet*. Sustainable Infrastructure. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/31291>.
- S&P Global. 2021. "Contentious Macquarie Sale Back in Focus as UK Plans New Green Investment Bank." S&P Global Market Intelligence, February 9, 2021. <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/contentious-macquarie-sale-back-in-focus-as-uk-plans-new-green-investment-bank-2480596#:~:text=But%20the%20government%20decided%20to.abandoning%20the%20bank's%20green%20mission>.

- SDG Sovereign Bond Framework. United Mexican States, Building Prosperity: Financing SDGs for an Inclusive Economy. https://www.finanzaspublicas.hacienda.gob.mx/work/models/Finanzas_Publicas/docs/ori/Espanol/SDG/UMS-SDG_Sustainable_Bond_Framework.pdf.
- Saner, Patrick, Fiona Gillespie, Lori Kerr, and Carmel Lev. 2021. *Closing the Infrastructure Gap: Mobilising Institutional Investment into Sustainable, Quality Infrastructure in Emerging Markets and Developing Economies (EMDEs)*. Global Infrastructure Facility and Swiss Reinsurance Company Ltd, 2021. https://www.globalinfrastructure.org/sites/gif/files/2021-03/swiss-re-institute-publication-closing-the-infrastructure-gap-2021_0.pdf
- SASB (Sustainability Accounting Standards Board). 2018. Electric Utilities & Power Generators. Sustainable Industry Classification System 46. https://www.sasb.org/wp-content/uploads/2018/11/Electric_Utilities_Power_Generators_Standard_2018.pdf.
- Seddon, Nathalie. 2019. "Understanding the Value and Limits of Nature-Based Solutions to Climate Change and Other Global Challenges." *Philosophical Transactions of the Royal Society B: Biological Sciences* 375 (1794): 20190120,. <https://doi.org/10.1098/rstb.2019.0120>.
- Serebrisky, Tomás. 2018. *IDBG Framework for Planning, Preparing, and Financing Sustainable Infrastructure Projects: IDB Sustainable Infrastructure Platform*. IDB (Inter-American Development Bank). <https://doi.org/10.18235/0001037>.
- Siemens. Industry Software. Accessed August 1, 2022. <https://new.siemens.com/global/en/products/automation/industry-software.html>.
- SIF (Sustainable Infrastructure Foundation). <https://public.sif-source.org/>.
- Smith School of Enterprise and the Environment. 2022. Global Recovery Observatory—Oxford University Economic Recovery Project. Oxford, 2021. Accessed July 6, 2022. <https://recovery.smithschool.ox.ac.uk/tracking>.
- South Africa, Department of Public Works and Infrastructure. 2022. Goewermentskennisgewings: National Infrastructure Plan 2050 (NIP 2050). South Africa Government Notices, March 11, 2022. https://www.gov.za/sites/default/files/gcis_document/202203/46033gon1874.pdf.
- Susantono, Bambang, Yongping Zhai, Ram M. Shrestha, and Lingshui Mo, eds. 2021. *Financing Clean Energy in Developing Asia: Volume 1*. Manila, Philippines: ADB (Asian Development Bank). <http://dx.doi.org/10.22617/TCS210206-2>.
- Tall, Arame, Sarah Lynagh, Candela Blanco Vecchi, Pepukaye Bardouille, Felipe Montoya Pino, Elham Shabahat, and Vladimir Stenek. 2021. *Enabling Private Investment in Climate Adaptation and Resilience, Current Status, Barriers to Investment and Blueprint for Action*. Washington, DC: World Bank. <https://doi.org/10.1596/35203>.
- TAV Airports Holding Company. Environmental Sustainability. <https://tavairports.com/en-EN/sustainability/pages/environmental-sustainability>.
- TNFD (Task Force on Nature Related Disclosure). <https://tnfd.global/>.
- Tye, Stefanie, John-Rob Pool, and Luciana Gallardo Lomeli. 2022. "The Potential for Nature-Based Solutions Initiatives to Incorporate and Scale Climate Adaptation." World Resources Institute 36. <https://doi.org/10.46830/wriwp.21.00036>
- UK Infrastructure Bank. 2022. "Clean Energy to Be Largest Sector for Investment in £22bn Infrastructure Bank Plan." UK Infrastructure Bank (news release), June 23, 2022. <https://www.ukib.org.uk/news/UKIB-launches-its-first-strategy>.
- UN (United Nations). 2018. *Financing the 2030 Agenda*. UN. <https://www.undp.org/publications/financing-2030-agenda>.

- UN Environment Inquiry and Corporate Knights. 2017. *Financial Centres For Sustainability: Reviewing G7 Financial Centres in Mobilizing Green and Sustainable Finance*. United Nations Environment Programme. <https://www.greenfinanceplatform.org/sites/default/files/downloads/best-practices/Financial%20Centres%20for%20Sustainability.pdf>
- UN-convened Net-Zero Asset Owner Alliance. 2021. *Scaling Blended Finance*. UN Environment Programme and Principles for Responsible Investment (PRI). https://www.unepfi.org/wordpress/wp-content/uploads/2021/12/NZAOA_Scaling-Blended-Finance.pdf.
- UNDP (United Nations Development Programme). SDG Investor Platform. Road Construction and Maintenance. <http://sdginvestorplatform.undp.org/market-intelligence/road-construction-and-maintenance>.
- UNECE (United Nations Economic Commission for Europe). 2018. "Guiding Principles on People-First Public-Private Partnerships (PPPs) for the United Nations Sustainable Development Goals (UN SDGs): Part II-The 8 Guiding Principles for People-First PPPs in Support of the UN SDGs." UNECE, May 3, 2018. https://unece.org/fileadmin/DAM/ceci/documents/2018/PPP/Forum/Documents/The_8_Guiding_Principles_for_People-first_PPPs_in_support_of_the_UN_SDGs-Part_II.pdf.
- UNEP (United Nations Environment Programme). 2021. "International Good Practice Principles for Sustainable Infrastructure." UNEP Publications, February 2021. <https://www.unep.org/resources/publication/international-good-practice-principles-sustainable-infrastructure>.
- US Commercial Law Development Program. 2022. Energy Transition. US Commercial Law Development Program (training content). <https://cldp.doc.gov/areas-expertise/energy-transition>.
- US Commercial Law Development Program. Energy Transition. Training Content. <https://cldp.doc.gov/areas-expertise/energy-transition>.
- USAID (United States Agency for International Development). 2021. *Power Africa Annual Report 2021*. Washington, DC: USAID. <https://www.usaid.gov/sites/default/files/documents/2021-Power-Africa-Annual-Report.pdf>.
- USAID (US Agency for International Development). 2016. "The CrossBoundary Energy Partnership," September." USAID. https://www.usaid.gov/sites/default/files/documents/1865/PCM_CrossBoundary_9_19_2016.pdf.
- USAID (US Agency for International Development). 2021. *US-India Clean Energy Finance*. <https://www.usicef.org/>.
- Usov, Anton. 2021. "EBRD Finances Key Infrastructure Upgrades at Almaty International Airport." EBRD (European Bank for Reconstruction and Development) (news release), 2021. <https://www.ebrd.com/news/2021/ebrd-finances-key-infrastructure-upgrades-at-almaty-international-airport.html>.
- Walker, Oliver, and Moro Aris. 2019. *Electrifying Bus Routes: Insights from Mexico City's Eje 8 Sur, Technology Assessment*. C40 Cities Finance Facility, Transport Guidance Document. <https://www.c40cff.org/knowledge-library/electrifying-bus-routes-insights-from-mexico-citys-eje-8-sur>.
- WBG (World Bank Group). 2021. "Multilateral Development Bank Climate Finance for Developing Countries Rose to US\$38 Billion, Joint Report Shows." WBG (press release), July 2, 2021. <https://www.worldbank.org/en/news/press-release/2021/07/02/mdbs-climate-finance-for-developing-countries-rose-to-us-38-billion-joint-report-shows>.
- WBG (World Bank Group). 2020. *World Bank Group Approaches to Mobilize Private Capital for Development: An Independent Evaluation*. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/35040>.
- WEF (World Economic Forum). 2015. *Africa Strategic Infrastructure Initiative: A Principled Approach to Infrastructure Project Preparation Facilities*. Switzerland: WEF. <https://reports.weforum.org/africa-strategic-infrastructure-initiative>.
- WEF (World Economic Forum). 2020. *Measuring Stakeholder Capitalism Towards Common Metrics and Consistent Reporting of Sustainable Value Creation*. WEF. <https://www.weforum.org/reports/measuring-stakeholder-capitalism-towards-common-metrics-and-consistent-reporting-of-sustainable-value-creation/>.

- WEF (World Economic Forum). 2022. "Over 70 Global Companies Adopt ESG Reporting Metrics." WEF, 2022. <https://www.weforum.org/impact/stakeholder-capitalism-esg-reporting-metrics/>.
- Wojazer, Philippe. 2022. "Macron, Bloomberg Seek Better Monitoring of Business Climate Action." Reuters, June 3, 2022. <https://www.reuters.com/business/sustainable-business/macron-bloomberg-seek-better-monitoring-business-climate-action-2022-06-03/>.
- World Bank, IFC (International Finance Corporation), and MIGA (Multilateral Investment Guarantee Agency). 2022. Climate Toolkits for Infrastructure PPPs. World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/37287>.
- World Bank, IFC (International Finance Corporation). Scaling Mini-Grid (SMG). https://www.ifc.org/wps/wcm/connect/industry_ext_content/ifc_external_corporate_site/infrastructure/priorities/power/scaling+mini-grid.
- World Bank. 2017. *The World Bank Environmental and Social Framework*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/383011492423734099/The-World-Bank-Environmental-and-Social-Framework>.
- World Bank. 2019. *Gender Equality, Infrastructure and PPPs*. Washington, DC: World Bank. <https://library.pppknowledgelab.org/documents/5720/download>.
- World Bank. 2020. "InfraTech Policy Toolkit." World Bank. <https://openknowledge.worldbank.org/bitstream/handle/10986/34326/InfraTech-Policy-Toolkit.pdf?sequence=1&isAllowed=y>.
- World Bank. 2021. Climate Change Action Plan (2021-2025): Supporting Green, Resilient, and Inclusive Development. <http://hdl.handle.net/10986/35799>.
- World Bank. 2021. *Private Participation in Infrastructure: 2021 Annual Report*. Washington, DC: World Bank. 2021. <https://ppi.worldbank.org/content/dam/PPI/documents/PPI-2021-Annual-Report.pdf>.
- World Bank. 2022. "Common Principles for Climate Mitigation Finance Tracking." August 2022. <https://www.worldbank.org/content/dam/Worldbank/document/Climate/common-principles-for-climate-mitigation-finance-tracking.pdf>.
- World Bank. 2022. "Supporting Egypt's Inaugural Green Bond Issuance." World Bank, March 15, 2022.
- World Bank. 2022. Climate-Smart PPP Legal and Regulatory Framework. World Bank, Washington DC. <https://ppp.worldbank.org/public-private-partnership/climate-smart/climate-smart-clean-technology-ppps/climate-smart-ppp-legal-and-regulatory-framework>.
- World Bank. 2022. *Country Climate and Development Reports (CCDRs)*. Accessed August 1, 2022. <https://www.worldbank.org/en/publication/country-climate-development-reports>.
- World Bank. 2022. "World Bank Group Launches First Country Climate and Development Report." World Bank (press release), June 16, 2022. <https://www.worldbank.org/en/news/press-release/2022/06/16/world-bank-group-launches-first-country-climate-development-report>.
- World Bank, IFC (International Finance Corporation), and MIGA (Multilateral Investment Guarantee Agency). 2022. "Climate Toolkits for Infrastructure PPPs." World Bank. <https://openknowledge.worldbank.org/handle/10986/37287>.
- World Business Council for Sustainable Development. 2017. "Incentives for Natural Infrastructure: Review of Existing Policies, Incentives and Barriers Related to Permitting, Finance and Insurance of Natural Infrastructure." Geneva: World Business Council for Sustainable Development. https://docs.wbcsd.org/2017/05/Incentives_for_Natural_Infrastructure.pdf.
- WRI (World Resources Institute). 2022. Just Transitions and Equitable Climate Action Resource Center: Snapshots. Accessed July 6, 2022. <https://www.wri.org/just-transitions/snapshots>.
- Xu, Jiajun, Kedi Wang and Xinshun Ru. 2020. *Funding Sources of National Development Banks*. Peking University, NSE Development Financing Research Report No. 3, November 2020. <https://www.nse.pku.edu.cn/docs/20201105164251956962.pdf>.

Yes Bank. About Us. <https://www.yesbank.in/about-us/sustainability-at-yes-bank/sustainable-finance>.

Zelikow, Daniel, and Fuat Savas. 2022. "Mind the Gap: Time to Rethink Infrastructure Finance." World Bank (blog), May 20, 2022. <https://blogs.worldbank.org/ppps/mind-gap-time-rethink-infrastructure-finance>.

Zgheib, Nimal. 2021. "EBRD Finances 6th of October Dry Port in Egypt under EBRD Green Cities." EBRD (European Bank for Reconstruction and Development) (news release), September 13, 2021. <https://www.ebrd.com/news/2021/ebrd-finances-6th-of-october-dry-port-in-egypt-under-ebrd-green-cities-.html>.

Zuñiga, Mariana Silva, Wilhelm Dalaison, and Cristina Calderón. 2019. "Three Good Practices of Peru's National Infrastructure Plan for Sustainable Economic Growth." IDB (Inter-American Development Bank) blog post, August 15, 2019. <https://blogs.iadb.org/sostenibilidad/en/three-good-practices-of-perus-national-infrastructure-plan-for-sustainable-economic-growth/>.

Photo Credits

Cover © geniusksy/Shutterstock

Page 2 © Sunshine Seeds/Shutterstock

Page 6 © Nguyen Quang Ngoc Tonkin/Shutterstock

Page 12 © Gorodenkoff/Shutterstock

Page 13 © Felipe.P/Shutterstock

Page 26 © Mr. Cheangchai Noojuntuk/Shutterstock

Page 32 © Manop Boonpeng/Shutterstock

Page 38 © dadao/Shutterstock

Page 39 © Andrea Slatter/Shutterstock

Page 53 © Benoit Daoust/Shutterstock

Page 54 © Gorodenkoff/Shutterstock

Acknowledgements

This report was prepared by the Global Infrastructure Facility (GIF) and the Infrastructure Finance, PPPs and Guarantees (IPG) Group at the World Bank for the G20 Infrastructure Working Group (IWG) under the Group of Twenty (G20) Presidency of Indonesia. The World Bank and GIF team, under the leadership of Imad Fakhoury (Global Director, IPG) and Jason Zhengrong Lu (Head, GIF), was comprised of (names listed in alphabetical order by last name): Sara Ahmed (Partnerships Specialist), David Bloomgarden (Consultant), Gloriana Echeverria (Consultant), Juan Echeverri (Senior Infrastructure Finance Specialist), Helen Gall (Consultant), Michael Kane (Senior Infrastructure Finance Specialist), Dmitry Lesnichiy (Consultant), Carmel Lev (Program Officer), Mark Moseley (Consultant), Mariana Carolina Silva Zuniga (Senior Infrastructure Finance Specialist), Lenora Marie Suki (Consultant), and Javier Montero Vivas (Consultant). The initial draft of the report was researched and prepared by Lenora Marie Suki (Consultant), with research inputs from Dmitry Lesnichiy (Consultant).

The team would like to thank the peer reviewers during various stages of report preparation, including (names listed in alphabetical order by last name): Aijaz Ahmad (Lead PPP Specialist, World Bank), Catiana Garcia-Kilroy (Lead Financial Sector Specialist, World Bank), Ksenia Gutsol (Extended Term Consultant, International Finance Corporation (IFC)), Matthew Jordan-Tank (Director of Sustainable Infrastructure Policy and Project Preparation, European Bank for Reconstruction and Development), Rupinder Rai (Analyst, World Bank), Edgar Saravia (Principal Investment Officer, IFC), Gisele Saralegui (Global Climate Head for PPP Advisory and Infrastructure, IFC), Fuat Savas (Managing Director, Co-Head of Infrastructure Finance and Advisory, J.P. Morgan), Jordan Z. Schwartz (Country Director for Argentina, Paraguay and Uruguay, World Bank), and Satheesh Kumar Sundararajan (Lead Infrastructure Finance Specialist, World Bank).

The team would also like to thank the formal interview participants (as detailed in Appendix A), who provided valuable input to strengthen the report with market players' views on this critical topic.

The report builds on, and complements, previous work advanced by the G20's infrastructure agenda, in coordination with key international organizations (IOs), including the Global Infrastructure Hub (GIH) and the Organisation for Economic Co-operation and Development (OECD), and has benefited from discussions held at the G20 IWG under the G20 Presidency of Indonesia in 2022.

The report was edited by Luba Vangelova and designed by Victoria Adams-Kotsch.

