Inter-American Development Bank

Concept Note for the PPP Talk panels on Climate Investment and Digital Transformation

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SECTION 1 INTRODUCTION

The Inter-American Development Bank (IDB) holds the *PPP Americas* every two years in partnership with a national or subnational government. The regional forum brings together top professionals and public and private-sector representatives from **Latin America and the Caribbean** (LAC) to discuss groundbreaking topics and exchange ideas on planning, structuring, and managing public-private partnerships (PPPs). For the 2023 conference, the IDB is holding three preparatory events - **the PPP Talks** – before the main event. During the PPP Talks, invited experts will lay the groundwork for the discussions to be held during the conference.

The first PPP Talk will consist of two panels on December 1st, 2022: **Climate Investment** and **Digital Transformation** – both topics are part of the thematic agenda of PPP Americas 2023. This Concept Note provides the conceptual framework of the two themes discussed during these panels. In addition, this note offers descriptions of key concepts, as well as the main opportunities and challenges that countries in Latin America and the Caribbean face in each area. Section 2 below presents the topic of the first panel (Climate Investment), while Section 3 presents the basis for the second panel (Digital Transformation).

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SECTION 2 CLIMATE INVESTMENT

Infrastructure will determine Latin America's climate future. Mainly because, on average, an estimated 60 percent of the region's current greenhouse gas (GHG) emission levels arise from infrastructure construction and operation.[1] At the same time, the frequency and intensity of climate events threaten infrastructure reliability and delivery of essential services through more extreme and frequent weather-related events such as hurricanes, storms, and flooding.

Climate change mitigation and adaptation are imperative as climate-related disasters and shocks are becoming more frequent and of a larger magnitude, damaging more infrastructure and repeatedly disrupting the provision of essential services.[2] Most of these disruptions will derive from flooding, erosion, sedimentation, extreme temperatures, drought, and unpredictable weather patterns.[3] Infrastructure will need to absorb, withstand, and recover from climate shocks—including sudden changes in demand—to ensure economic viability in the region in the medium and long term.[4] Moreover, many risks associated with climate change will be felt hardest by lower-income countries, as their ability to prevent and respond to the impacts of climate change is limited. According to the Intergovernmental Panel on Climate Change (IPCC), increased heatwaves, droughts, and floods are already coinciding, exposing millions of people to acute food and water insecurity, especially in Africa, Asia, and Central and South America.[5] It is, therefore, crucial to ensure that infrastructure in Latin America and the Caribbean (LAC) is climate resilient and that its development does not further contribute to global warming.

In its path towards sustainable growth, LAC must invest around USD 2.2 trillion in infrastructure in the next decade to advance the achievement of the infrastructure-related Sustainable Development Goals.[6] Moreover, the region must spend between USD 15-18 billion each year on its adaptation financing needs (that is, on prevention and response).[7] Nonetheless, it has been estimated that investing in making infrastructure resilient results in more significant benefits than costs, in a ratio of 4 to 1.[8]

Today's infrastructure investment levels are insufficient to realize an effective transformation to a sustainable, equitable, net-zero, and climate-resilient economy. Moreover, the pandemic has

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[1] IDB/IDB Invest. 2018. "*What is Sustainable Infrastructure. A Framework to Guide sustainability Across the Project Cycle.*" Accessed September 15, 2022. https://publications.iadb.org/en/what-sustainable-infrastructure-framework-guide-sustainability-across-project-cycle
[2] Global Center on Adaptation. 2021. "*Climate-Resilient Infrastructure Officer Handbook*". Accessed September 26, 2022. https://gca.org/reports/climate-resilient-infrastructure-officer-handbook/.
[3] Ibid.
[4] World Bank. 2022. "*Climate Toolkits for Infrastructure PPPs*". Accessed September 26, 2022. https://documents1.worldbank.org/curated/en/099120004052270615/pdf/P1746330d584ff0210a9670dcf49a5becb0.pdf.
[5] IPCC. 2022. *"Climate change: a threat to human wellbeing and health of the planet. Taking action now can secure our future."* Accessed September 26, 2022. https://www.ipcc.ch/2022/02/28/pr-wgii-ar6/.
[6] IDB. 2020. *From Structures to Services: The Path to Better Infrastructure in Latin America and the Caribbean*.
[7] IDB Invest. 2022. "*Scaling-up Adaptation Finance in the Private Sector".* Forthcoming.
[8] IDB Invest. 2022. "*Scaling-up Adaptation Finance in the Private Sector*". Forthcoming.

reinforced these needs. If recent financing patterns continue, with around 30 percent of private participation in total investment, the investment required from the private sector would reach USD 660 billion in the next decade.[9]

Climate investment is not only urgent but strategic. Decarbonizing LAC's economies could save billions of dollars. The savings have been estimated to be above USD 600 billion per year by 2050.[10] In addition, decarbonization measures, especially nature-based solutions (NbS), have been shown to generate millions of new jobs and stimulate economic growth. For example, the transition to net-zero emissions is expected to create 15 million new jobs (net) in LAC.[11] Furthermore, compared to traditional infrastructure, nature-based solutions deliver more jobs per dollar, higher economic returns, and are faster to implement and more sustainable in the long run.[12]

The private sector plays a major role in closing the infrastructure investment gap in a climate-smart way—in terms of financing, expertise, willingness to innovate, and technological know-how. Private companies and financial intermediaries are increasingly preparing climate transition plans and gearing their investments for reaching net-zero emissions. Private investment, which accounted for 75 percent of total investment in LAC's energy sector from 2016 to 2020, will continue to be a critical source of capital for the transition to low emissions.[13]

PPPS TO ACHIEVE OBJECTIVES ON MITIGATION AND ADAPTATION TO CLIMATE CHANGE

PPPs are increasingly becoming important instruments for developing mitigation and adaptation solutions to climate change in LAC. PPPs have a great potential to promote the development of low-carbon, climate-resilient (LCCR) infrastructure and innovative solutions to climate problems. The financing of PPPs through green bonds and other sustainability-linked products

[9] IDB. 2018. "*Descubriendo el velo sobre los Datos de Inversión en Infraestructura en América Latina y el Caribe*". Accessed November 15, 2022. *https://publications.iadb.org/en/publications/spanish/document/Descubriendo-el-velo-sobre-los-datos-de-inversi%C3%B3n-en-infraestructura-en-Am%C3%A9rica-Latina-y-el-Caribe.pdf*; and authors' calculations.

[10] One study estimates that decarbonization of the region's energy and transport sectors by 2050 could save USD 621 billion per year (Vergara, Fenhann, and Santos da Silva 2021). In the case of Costa Rica, the successful implementation of its National Decarbonization Plan, which aims to create a net-zero emissions economy by 2050, could bring USD 41 billion through energy savings, reduced cost of accidents and time wasted in congestion, and improvements in ecosystem services and agriculture yields (Groves, et al. 2020). In Peru, which is far more reliant on fossil fuels to produce electricity than Costa Rica, achieving net-zero emissions by 2050 could bring more than USD 150 billion in net benefits (Quirós Tortós, et al. 2021).

[11] IDB. 2020. "*Jobs in a Net-Zero Emissions Future in Latin America and the Caribbean*". Accessed November 15, 2022. *https://publications.iadb.org/en/jobs-in-a-net-zero-emissions-future-in-latin-america-and-the-caribbean*

[12] Global Center on Adaptation. 2021. "*Climate-Resilient Infrastructure Officer Handbook*". Accessed November 15, 2022. *https://gca.org/reports/climate-resilient-infrastructure-officer-handbook/*.

[13] IEA. 2021. "*Financing clean energy transitions in emerging and developing economies*". Accessed November 15, 2022. *https://iea.blob.core.windows.net/assets/6756ccd2-0772-4ffd-85e4-b73428ff9c72/FinancingCleanEnergyTransitionsinEMDEs_WorldEnergyInvestment2021SpecialReport.pdf*

is also emerging as an innovative instrument to engage investors interested in financing projects with direct climate-related results.

PPPs can help bridge the financing gap and spur the development of low-carbon, climate-resilient infrastructure. Many developed countries are already leveraging PPP frameworks to work toward mitigation and adaptation goals. For instance, the new framework used to finance energy generation projects with low greenhouse gas (GHG) emissions in the United Kingdom heavily mirrors a traditional PPP structure.[14] Table 1 describes some reasons why PPPs can be helpful in procuring low-carbon, climate-resilient infrastructure projects.

Table 1: Why are PPPs Useful for Climate-Smart Infrastructure Projects

Aspect	Benefits
Incentive framework	The private sector is remunerated through its participation in the PPP, either from mechanisms like user fees (e.g., highway tolls) or through availability payments, in which the public sector pays the private party based on an assessment of performance indicators. In addition, remuneration to the private contractor is typically based on contractual project specifications, creating an incentive for the contractor to deliver the asset according to those specifications. This structure provides an opportunity to include climate resilience principles in these incentives.
Output focus	PPP structures are typically focused on outputs defined by the public client (service levels) rather than input specifications – that is, what needs to be achieved rather than how it should be executed. This provides the opportunity for private sector innovation. Tender requirements can and should promote incentives for innovation and harness the benefits from lower emissions and higher resilience, for example, by giving additional points in the evaluation of bids.
Consider lifecycle costs	PPPs require public officials to consider the long-term costs of infrastructure assets. This creates greater discipline in the infrastructure procurement process—private parties must look beyond just the construction phase to evaluate the costs over the project's life (25-30 years). In this process, private parties have incentives to consider all potential risks and costs, including climate change-related ones. As a result of this more lifecycle view of the project and its risks, PPPs may lead to better-designed infrastructure projects to withstand climate events.
Include lender's due diligence	By their nature, PPPs bring in private finance and, as a result, can bring increased oversight of project robustness through the due diligence performed by financial institutions. Lenders

[14] Global Center on Adaptation. 2021. "*Climate-Resilient Infrastructure Officer Handbook*". Accessed September 26, 2022. https://gca.org/reports/climate-resilient-infrastructure-officer-handbook/.

Aspect	Benefits
	must verify if the project can perform well over its life and service its debt. Climate risks, which materialize, can impact a project's ability to generate cash flows. As a result, many lenders examine climate risks as part of their Environmental and Social due diligence.
Robust risk assessment	A robust PPP project comprises a thorough risk assessment that evaluates all possible risks and assigns them to the party best able to manage them. Including an analysis of climate and disaster risk as part of this existing process only makes sense, as PPP project developers are seeking to understand any/all risks which may disrupt services and undercut their returns. A disciplined climate risk analysis assesses climate hazard, exposure, and vulnerability levels to future events.
Operational experience	PPPs are a relatively common tool for procuring infrastructure projects in specific sectors across the globe. Several governments and private organizations alike have skills and capacity around these arrangements. Climate resilience can be integrated into the project design and the PPP project cycle.
Efficiency in recovery after a hazard occurrence	Provided that an adequate and effective risk-sharing mechanism is in place, PPPs may reduce the strain on governments by maximizing private sector efficiencies during the operation and maintenance phase in the event of a climate hazard. The private partner needs to ensure the longevity of the infrastructure and service continuity in the event of a hazard or have the mechanisms in place to restore service quickly. By sharing the burden of infrastructure and service recovery between the public and private sectors, the public sector can redirect potentially saved resources to other aspects of recovery in the case of a hazard.

Source: Adapted from IDB. 2020. "Climate Resilient Public Private Partnerships: A Toolkit for Decision Makers." Global Center on Adaptation. 2021. "Climate-Resilient Infrastructure Officer Handbook."

Although LAC countries have made progress toward achieving their climate goals,[15] this progress is still insufficient to ensure that the region's infrastructure is prepared to withstand and recover from future climate shocks and stressors. PPP frameworks can help include climate action in the procurement and development of infrastructure. Some of the most significant innovation opportunities in the field of climate-smart solutions are listed below:[16]

[15] WRI. 2022. "*Tracking Latin America's Progress on Climate Action*". Accessed September 26, 2022. *https://www.wri.org/insights/tracking-progress-climate-latin-america*.
[16] IFC. 2021. "Ctrl-Alt-Delete: A Green Reboot for Emerging Markets*"*. Accessed on November 15, 2022. *https://www.ifc.org/wps/wcm/connect/26f79a1b-c191-494b-b2d9-c891e138bb37/IFC_GreenReport_FINAL_web_1-14-21.pdf?MOD=AJPERES&CVID=ns1JvaR*

- **Renewable energy** development, including distributed generation and storage solutions, offshore renewable energy.
- **Climate-smart urban mobility solutions**, including electromobility, green urban transport, urban logistics solutions, digitalization of urban mobility, and air travel, shipping, and logistics.
- **Green buildings**, including retrofitting of existing buildings and sustainability standard certification for new buildings.
- **Solid Waste Management and Circular Economy innovations**, including innovations in processes (recycling and upcycling technologies, waste disposal optimization), products (e.g., reconsider packaging), and business model innovations (new models of customer engagements such as buyback at the end of the cycle, or shared used models).

Opportunities and challenges for PPPs to help achieve climate goals in the region

PPPs are well-positioned to leverage the investments needed to help close the region's gaps in infrastructure. In addition to the prolonged effects of the COVID-19 pandemic, LAC economies are now experiencing the global impact of war in Ukraine. These combined factors lead to slower economic growth, inflationary pressures, and higher interest rates. These impacts will likely continue to exacerbate fiscal constraints of governments in the region, as well as jeopardize the utilities' ability to provide high-quality, reliable services, particularly during climate shocks. Therefore, PPPs can help governments use available funding more efficiently, particularly during fiscal tightening, and to attract the finance needed for infrastructure development. Moreover, private participation in infrastructure commitments accounted for about 0.46 percent of LAC's regional GDP in 2021.[17] However, a small number of countries still concentrate the region's projects.

To fully take advantage of PPPs to address climate challenges, governments in LAC must implement enabling conditions. Many countries need to develop or consolidate institutional and regulatory frameworks for PPPs. Moreover, most countries still need to increase their capacity for project structuring and preparation to develop bankable project pipelines. A recent study commissioned by the IDB, the 2021/22 Infrascope,[18] found that few countries in the region place appropriate attention on developing environmentally and socially sustainable PPPs. Out of 26 countries surveyed, 19 countries neither actively evaluate PPP performance against climate change goals nor evaluate performance against Sustainable Development Goals (SDGs). Only seven countries in the region require PPPs to incorporate elements related to resilience and

[17] World Bank, 2021. "*Private Participation in Infrastructure. 2021 Annual Report".* Accessed November 21, 2022. *https://ppi.worldbank.org/content/dam/PPI/documents/PPI-2021-Annual-Report.pdf.*
[18] The 2021/22 Infrascope is an informational tool and benchmarking index that assesses the capacity of countries in Latin America and the Caribbean (LAC) to carry out sustainable public-private partnerships (PPPs) in infrastructure.

adaptability into their design. The study also found that disaster risk management is one of the region's weakest areas of PPP risk management.[19]

Countries will need to improve their capacity to identify, structure, and procure projects that help close infrastructure gaps and contribute to achieving climate goals at the same time. For this, a robust lifecycle evaluation of cost and savings in PPP investments that integrate climate mitigation and resilience components needs to take place to account for the potential savings and reduction of risk of total asset loss that comes with climate-smart projects. The latter will shed more clarity on the justification for potential increases in costs. Therefore, governments and PPP practitioners must be able to calculate the benefits of climate action over the whole life cycle of PPP projects, including the estimation of non-monetary benefits.[20] In some situations, countries can consider developing GHG offsetting mechanisms—such as carbon credits—into the PPP designs when needed and feasible. This could help improve the sustainability of PPP projects that could bring about negative mitigation impacts.

PPP AS A TOOL TO PROMOTE INNOVATION IN LOW EMISSIONS AND RESILIENT INFRASTRUCTURE PROJECTS

Leveraging PPPs for climate action includes enabling innovation. A significant challenge related to PPPs for climate action is the choice that government and private parties alike have between requesting and bringing forward projects that employ established technologies versus proposing innovative solutions, respectively. It is common for PPP procurement procedures to incentivize lower-cost solutions, which may translate to mainstream technologies.[21] In addition, public sector entities may have limited knowledge of the appropriateness of specific technologies in projects, and it is not common for the private sector to provide feedback on this during the early stages of project development. Later in the procurement phase, there is less room to put forward these considerations if they are not explicit in the tender documents.[22]

Synergies between the public and private sectors to allow for climate innovation in PPPs are key. How much PPPs can be leveraged to promote innovative solutions to climate problems will largely depend on synergies between the public authorities developing project pipelines and the private sector working on new technologies and approaches or the flexibility of the contract structures. During project preparation, the competitive dialogue procedure[23] allows bidders to

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[19] IDB and Economist Impact. 2022. "*The 2021/22 Infrascope. Evaluating the environment for public-private partnerships in Latin America and the Caribbean.*" Accessed on November 3, 2022. https://impact.economist.com/projects/infrascope.
[20] World Bank. 2022. "*Climate Toolkits for Infrastructure PPPs*". Accessed September 26, 2022. https://documents1.worldbank.org/curated/en/099120004052270615/pdf/P1746330d584ff0210a9670dcf49a5becb0.pdf.
[21] Koppenjan, J.F.M. 2015. "*Public–Private Partnerships for green infrastructures. Tensions and challenges.*" Current Opinion in Environmental Sustainability, 12 (February 2015), 30-35.
[22] Ibid.
[23] Ibid.

propose innovative ideas under competitive conditions. With government awareness, incorporating climate change mitigation and adaptation considerations can be included as part of the Request for Proposals (RfP). PPP contracts can also be structured so that they allow for the introduction of appropriate climate-smart technologies as they become available.

Nature-based Solutions (NbS) are an example of a nascent yet innovative approach that could be harnessed in PPPs. NbS could be incorporated into a PPP contract to build resilience and minimize the effects of climate shocks and stresses. The European Commission defines NbS as *solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social, and economic benefits and help build resilience; such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes, and seascapes, through locally adapted, resource-efficient and systemic interventions.*[24] Besides contributing to climate change adaptation and resilience, NbS can help countries in LAC achieve other Sustainable Development Goals (SDGs). In addition, they can help capture carbon, make net biodiversity gains, improve water quality and waterbody conditions, contribute to microclimate regulation, and air quality, and improve health and well-being.[25]

GREEN BONDS AS INSTRUMENTS TO FINANCE PPP

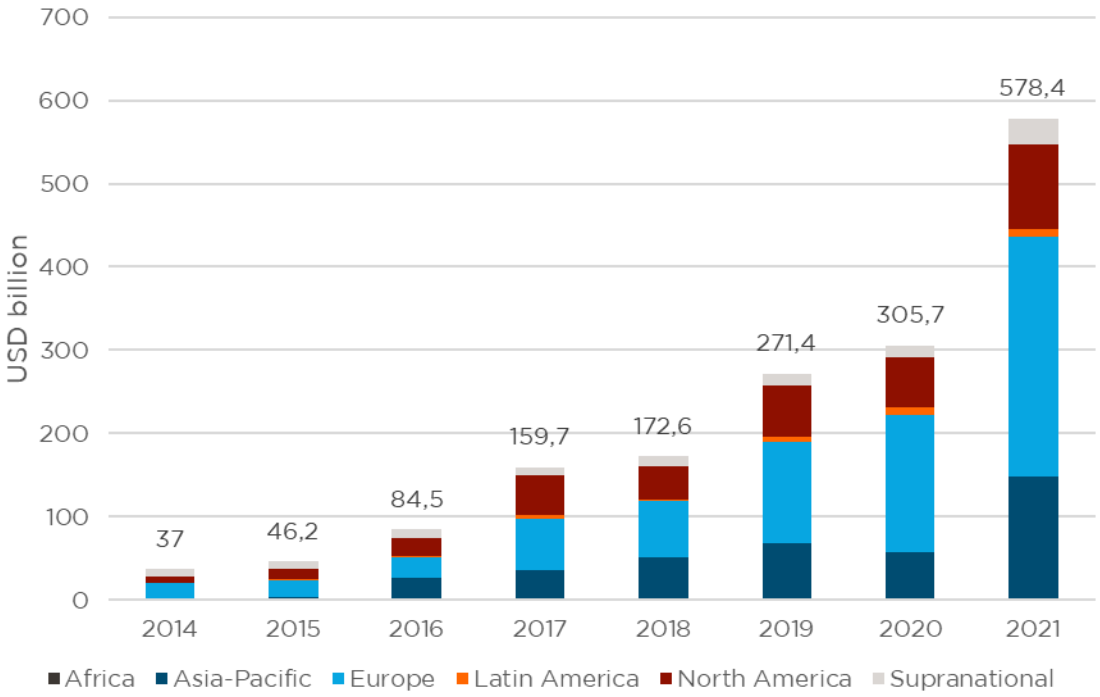
The financing of PPPs through green bonds and other sustainability-linked products is increasingly being used to mobilize resources from investors interested in projects with explicit climate-related results.[26] A green bond is a form of financing that uses the funds raised exclusively to finance or refinance climate and environmental projects. Green bonds are usually fixed-income financial instruments that raise capital from investors through the debt capital market.[27] Although green bonds have usually been used to finance low-carbon projects—for example, projects related to renewable energy and energy efficiency—they can also be used to raise funds for other sectors such as transport, water, and sanitation. In addition, green bonds

[24] European Commission. 2020. "*NbS - State of the Art in EU-funded Projects*". Accessed September 26, 2022. *https://ec.europa.eu/info/files/nature-based-solutions-state-art-eu-funded-projects_en*.
[25] Global Center on Adaptation. 2021. "*Climate-Resilient Infrastructure Officer Handbook*". Accessed September 26, 2022. *https://gca.org/reports/climate-resilient-infrastructure-officer-handbook/.*
[26] IDB. 2022. "Financiamiento sostenible de la infraestructura económica y social en América Latina y el Caribe: tendencias, actores e instrumentos". Accessed November 15, 2022. *https://publications.iadb.org/es/financiamiento-sostenible-de-la-infraestructura-economica-y-social-en-america-latina-y-el-caribe*
[27] OECD. 2015. "*Green bonds. Mobilizing the debt capital markets for low-carbon transition.*" Accessed September 27, 2022. *https://www.oecd.org/environment/cc/Green%20bonds%20PP%20%5Bf3%5D%20%5Blr%5D.pdf*.

are increasingly being used to finance projects related to adaptation and resilience to physical climate risks.[28]

The market for green bonds has grown rapidly since the first issuance in 2007 by the European Investment Bank. Since then, USD 1.5 trillion of labeled green bonds have been issued around the world.[29] Demand for green bonds increased significantly in recent years as investors aim to meet climate mandates and commitments, which has led to demand outstripping supply.[30] In 2021, USD 578 billion in green bonds were issued globally, representing an 89 percent increase from 2020. Figure 1 shows the annual green bond issuance by region from 2014 to 2021.

Figure 1: Annual Issuance of Green Bonds by Region, 2014-2021



Source: Consultant elaboration based on data from Climate Bonds Initiative. 2022. "Interactive Data Platform."

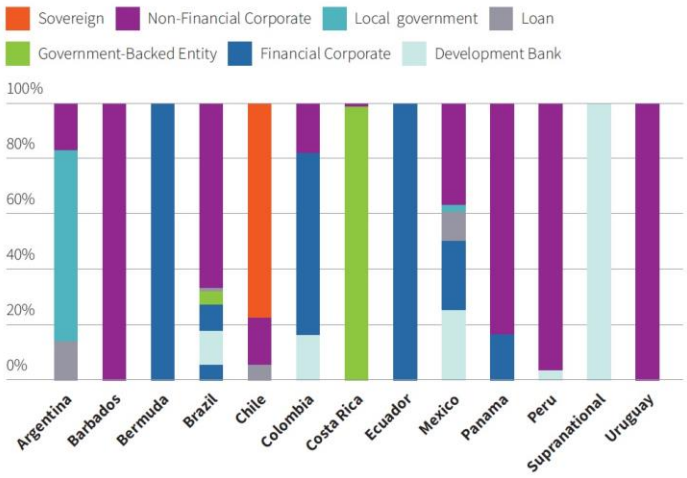
[28] Global Center on Adaptation. 2021. "*Green Bonds for Climate Resilience – State of Play and Roadmap to Scale*". Accessed September 27, 2022. *https://gca.org/wp-content/uploads/2021/10/Green-Bonds-for-Climate-Resilience_State-of-Play-and-Roadmap-to-Scale.pdf*.
[29] Ibid.
[30] OECD. 2015. "*Green bonds. Mobilizing the debt capital markets for low-carbon transition.*" Accessed September 27, 2022. *https://www.oecd.org/environment/cc/Green%20bonds%20PP%20%5Bf3%5D%20%5Blr%5D.pdf*.

Market- and government-led efforts to standardize the definition of green bonds have led to a growing consensus on standards and criteria for issuance.[31] This has spurred the development of key guidelines for issuing green bonds, such as the Green Bond Principles (GBP) and the Climate Bond Standard. The GBP is a self-regulatory initiative designed to promote integrity in the green bond market through guidelines that recommend transparency, disclosure, and reporting.[32] Similarly, the Climate Bond Standard and its certification scheme aim to provide the green bond market with the trust and assurance it needs to achieve scale.[33]

The opportunity for growth in terms of green bond issuance in LAC countries is promising. Green bond issuance in the region increased from USD 200 million in 2014 to USD 8.9 billion in 2021.[34] The total size of the LAC green bond market was estimated to be USD 30.2 billion by the end of June 2021, which is more than the double reported two years prior (USD 13.6 billion).[35] Non-financial corporates have issued 39 percent of all green bonds in the region, while sovereign-issued green bonds account for 25 percent of the market.[36] However, Argentina, Chile, Costa Rica, and Mexico are the only countries in LAC to have issued public sector green bonds—that is, green bonds issued by sovereigns, local governments, or government-backed entities.[37] Figure 2 shows the region's green bond market by issuer type and country.

[31] Ibid.
[32] International Capital Market Association. 2021. "Green Bond Principles Voluntary Process Guidelines for Issuing Green Bonds". Accessed September 27, 2022. https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Green-Bond-Principles-June-2021-140621.pdf.
[33] Climate Bonds Initiative. 2019. "Climate Bonds Standard Version 3.0". Accessed September 27, 2022. https://www.climatebonds.net/files/files/climate-bonds-standard-v3-20191210.pdf.
[34] Climate Bonds Initiative. 2022. *"Interactive Data Platform"*. Accessed September 27, 2022. https://www.climatebonds.net/market/data/.
[35] Climate Bonds Initiative. 2021. "*Latin America and Caribbean (LAC): State of The Market 2021*". Accessed November 15, 2022. https://www.climatebonds.net/files/reports/cbi_lac_2020_04e.pdf
[36] Ibid.
[37] Ibid.

Figure 2: Green Bonds Issuance by Issuer Type and Country



Source: Climate Bonds Initiative. 2021. "Latin America and Caribbean (LAC): State of The Market 2021".

Opportunities and challenges for green bonds in PPP projects in LAC

Given the characteristics of green bonds, these instruments have the potential to finance further PPP projects related to climate mitigation and adaptation. Although issuance has increased substantially in the region, green bonds issued in LAC represented only 1.5 percent of the total global issuance in 2021, trailing behind all other regions except Africa. In addition, a recent study found that 13 countries in LAC have yet to employ sustainable financing instruments—such as green-, climate-, or development impact bonds—for infrastructure development.[38] Therefore, there is still room for this type of financing to grow in the region, possibly by financing well-structured PPPs.

The development of local capital markets is key to scaling green bonds and other associated instruments. As shown in Figure 2, the green bond market is still concentrated in a few economies. The low development of local capital markets partly explains this. The strengthening of local capital markets, including the sophistication of actors and associated regulation, are key enablers.

Project creditworthiness is a common challenge faced by issuers in the region. Special Purpose Vehicles (SPVs) are created as entities solely for construction and management tasks, which usually means that SPVs lack assets and financial history.[39] Therefore, the project's sponsors

[38] IDB and Economist Impact. 2022. "*The 2021/22 Infrascope. Evaluating the environment for public-private partnerships in Latin America and the Caribbean.*" Accessed November 3, 2022. *https://impact.economist.com/projects/infrascope*.
[39] IISD. 2015. "*Green Bonds in Public-Private Partnerships*". Accessed September 27, 2022. *https://www.iisd.org/publications/report/green-bonds-public-private-partnerships.*

must back up the bond issuance using their financial capacity.[40] Alternatively, international finance institutions—such as the IDB—can support bond issuance through guarantee schemes. These schemes may be essential in some contexts.

In addition, prospective bondholders are typically unwilling or unable to take risks associated with the construction of new assets and technologies. As a result, risks are considerably higher in the construction phase than in the operational phase.[41] Cost overruns and delays are common problems in infrastructure development in LAC, where they can be as much as two times the world average.[42] Therefore, up to now, bonds have been better suited for financing operations of projects that already have a steady and predictable cash flow. Between 2012 and 2021, about 60 percent of the region's project refinancing operations in infrastructure were conducted using bonds.[43] For this reason, PPPs developed in LAC need to identify and mitigate risks adequately to improve access to green bond markets.

Moreover, PPP practitioners in the region's public and private sectors need to improve their capacity to evaluate the implications of including green bonds in the projects' financial structure. Bond issuance usually takes more time and has higher structuring costs than standard bank lending, as more stakeholders are involved, and greater coordination is needed. Price volatility can also be an issue, as this type of financial instrument has a pricing risk based on possible bond price differences between when the bid is accepted and when the bond issuance is performed.[44]

In conclusion, green bonds are increasingly becoming a viable financing mechanism for PPPs in LAC, particularly for brownfield projects. However, the region faces several barriers to the large-scale use of green bonds for PPPs. Enabling conditions include developing capital markets and incentivizing bond instruments. In addition, from a project standpoint, improved capacity at financial structuring and using guarantee schemes and other risk mitigation mechanisms can scale green financing through bonds. This, in turn, can be a powerful tool to help countries in LAC achieve their climate mitigation and resilience goals.

As mentioned in the introduction of this paper, the topics developed throughout this section will be discussed in greater detail during the **PPP Talk** panel on **Climate Investment**. Experts from the private and public sectors will discuss how PPPs can leverage investments and innovation to help countries in LAC to achieve their climate goals. In addition, the participants will analyze how and the extent to which green bonds can be employed to attract investment for climate-smart projects in the region.

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[40] Ibid.
[41] IDB. 2022. "*Financiamiento sostenible de la infraestructura económica y social en América Latina y el Caribe: tendencias, actores e instrumentos*". Accessed November 3, 2022. https://publications.iadb.org/es/financiamiento-sostenible-de-la-infraestructura-economica-y-social-en-america-latina-y-el-caribe
[42] Ibid
[43] Ibid.
[44] IISD. 2015. "*Green Bonds in Public-Private Partnerships*". Accessed September 27, 2022. https://www.iisd.org/publications/report/green-bonds-public-private-partnerships.

SECTION 3 DIGITAL TRANSFORMATION

The last decade has evidenced the gaps in digital infrastructure in LAC. Remarkably, the COVID-19 pandemic provided lessons on how essential internet connection has become to a large share of the region's population. The second panel of this PPP Talk will highlight PPPs' role in improving LAC's digital infrastructure, emphasizing remote areas, and solving "last mile" problems. In addition, the panel will discuss the role that PPP projects will play in providing and improving digital public services in the region and reducing the digital divide. This section explores these topics to provide the basis for the panel's discussion.

THE ROLE OF PPPS IN IMPROVING DIGITAL INFRASTRUCTURE

There is a clear consensus among policymakers that developed digital infrastructure can increase productivity and business efficiency and improve living standards.[45] First, widespread broadband access can contribute to the transition to the formal economy, allowing governments to increase revenues through higher tax collection rates.[46] Second, digital infrastructure can also improve access to better education, health, and e-government services, promoting human capital and productivity. Third, studies on developed economies have also shown correlations between higher access to broadband and GDP and employment growth through efficiency gains for companies.[47]

The lockdowns driven by the COVID-19 pandemic showed that enhancing digital infrastructure and broadband access is more relevant than ever.[48] However, while many employees who already had broadband access used their home spaces to work, this was not feasible for many—the poor, minorities, the elderly, the disabled, women with a disproportionate share of family care, and people living in remote areas without internet access.[49] The bottom line is that transitioning to a digital economy is not an option for those disconnected from broadband.

Although there have been substantial improvements in internet connectivity in LAC during the last decade, broadband penetration in the region is still limited and highly concentrated in urban

[45] The United States Federal Communications Commission defines broadband access as an internet connection with a minimum of 25 Mbps download and 3 Mbps upload speeds. This definition may vary depending on the country.
[46] IDB. 2009. "Economic Development and Inclusion through Local Broadband Access Networks". Accessed October 3, 2022. *https://publications.iadb.org/publications/english/document/Economic-Development-and-Inclusion-through-Local-Broadband-Access-Networks.pdf*
[47] Ibid.
[48] IDB. 2020. The Impact of Digital Infrastructure on the Consequences of COVID-19 and on the Mitigation of Future Effects. Accessed November 3, 2022. *https://publications.iadb.org/publications/english/document/The-Impact-of-Digital-Infrastructure-on-the-Consequences-of-COVID-19-and-on-the-Mitigation-of-Future-Effects.pdf*
[49] World Bank. 2021. "*We need more progress on delivering digital broadband PPPs to underserved communities".* Accessed October 3, 2022. *https://blogs.worldbank.org/ppps/we-need-more-progress-delivering-digital-broadband-ppps-underserved-communities*.

areas. The gap is particularly significant when compared to average OECD levels. For instance, the fixed broadband penetration in the region reaches 13.5 percent, almost a third of the penetration in the OECD.[50] Similarly, the average mobile broadband penetration rate in LAC is just 73 percent, far from the OECD level (128 percent).[51] Moreover, the limited digital infrastructure deployed in the region has a direct impact in terms of the quality of services. While in OECD countries, the average speed is 142 Mbps, in LAC, the average speed rate is just 60 Mbps.[52] This directly impacts the quality of services that households and public institutions such as schools, hospitals, and police stations may enjoy.

To overcome this situation and catch up with OECD countries, the IDB estimates that the region needs to invest USD 71 billion.[53] Out of this amount, 41 percent relates to investment in rural and isolated areas required to ensure digital inclusion and equality across the population regardless of location. These investments require public and private intervention and could boost the economy by 8 percent, increase productivity by 6.5 percent, and create more than 16 million jobs.[54]

Opportunities and challenges for PPPs to improve digital infrastructure in LAC

The affordability of broadband internet access and investment needs for digital infrastructure improvements are key problems in LAC. According to the Broadband Index that the IDB publishes every year, households in LAC spend, on average, between 2 percent and 5 percent of their monthly revenues to have internet access. This is above the 2 percent threshold considered affordable by the International Telecommunications Union (ITU). Figure 3 shows countries with affordable internet prices highlighted in blue. However, dispersed populations and the prevalence of rural populations living in remote areas without appropriate transportation links increases the costs of connecting these communities making services less affordable. The combination of limited digital infrastructure and high prices explains the low penetration of internet services, especially in rural areas, which clearly impacts the continuity of public services. For instance, only 40 percent of schools in LAC are connected, far from the 98 percent of schools connected in OECD countries.[55]

[50] IDB. 2022. "*Digilac*". Accessed November 15, 2022. *https://digilac.iadb.org/en*.
[51] Ibid.
[52] Ibid.
[53] Ibid.
[54] Ibid.
[55] Ibid.

Figure 3: Countries in LAC with Affordable Internet Prices, 2020

Source: Alliance for Affordable Internet. 2020.

PPPs can be a useful framework to harness the investment needed to reduce LAC's digital infrastructure gaps.[56] PPP projects to reduce the urban-rural gap in internet connectivity are already underway in some countries in the region. For instance, the Internet for All project in Peru—developed in partnership between the IDB, CAF, Facebook, and Telefónica Peru—aims to expand mobile internet access to 30,000 rural locations in the country and reach around 6 million people.[57]

However, these initiatives are not widespread yet, and governments can make more effort to harness innovation and resources from the private sector to connect more people in rural areas. In addition, governments need to review and update their regulatory frameworks to ensure that PPPs can be employed to promote innovative information and communication technologies. Many LAC governments are yet to enact regulations on infrastructure sharing, green networks, and other models that could help reduce CAPEX and OPEX in digital infrastructure. This can help improve productivity, economic resilience, and marginalized communities living standards. Finally, stakeholders focused on providing PPP digital infrastructure need to address long-term sustainability risks of providing services in remote areas, such as technological obsolescence,

[56] PPPs can be a way to accelerate some specific type of digital infrastructure. However, there are also other alternatives to attract investments for digital infrastructure such as digital bonds, universal service funds, and minimum subsidies.
[57] IICA. 2020. "*Rural connectivity in Latin America and the Caribbean. A bridge for sustainable development in a time of pandemic.*" Accessed October 3, 2022. https://repositorio.iica.int/handle/11324/12896.

costs, and consumer needs.[58] This will contribute to turning these projects into bankable opportunities for risk-averse investors and more accessible to marginalized groups.[59]

DIGITAL PUBLIC SERVICES THROUGH PPPS

An often-overlooked area in digital transformation in the region is the provision of digital public services. The European Commission defines digital public services—also known as smart public services or eGovernment—as the use of technology to provide services to citizens at local, regional, and national levels.[60] These services may encompass most public services provided by governments, such as public education and health provision, identification issuance and management, and tax filing, among many others. The digitalization of public services can help governments increase efficiency through automatization, reduce the time people take to request services or follow procedures, and reduce the administrative load of businesses. Also, digitalization has the potential to reduce red tape and improve the user experience of public services, which can lead to increasing people's trust in their governments.

The potential for PPPs to help governments in the region provide efficient and accessible digital public services is significant. PPPs can help governments leverage innovation and technologies from private parties that otherwise would never reach public service. In addition, PPPs can reduce the need for upfront investments from public budgets, creating fiscal space for other priorities. Given the novelty of this type of arrangement, participants in this PPP Talk will discuss what PPP modalities would be more appropriate for this type of project. In addition, the panel will explore the opportunities that entrepreneurship can bring forward regarding digital public services. Finally, conclusions to the topics raised here, in both sessions, and during the live debate will be presented in a Discussion Paper to be published as part of the preparation for the PPP Americas 2023.

[58] World Bank. 2021. "*We need more progress on delivering digital broadband PPPs to underserved communities".* Accessed October 3, 2022. *https://blogs.worldbank.org/ppps/we-need-more-progress-delivering-digital-broadband-ppps-underserved-communities*.
[59] Ibid.
[60] European Commission. 2022. "*Digital public services and environments*". Accessed October 4, 2022. *https://digital-strategy.ec.europa.eu/en/policies/digital-public-services#:~:text=Smart%20public%20services%2C%20also%20known,local%2C%20regional%20and%20national%20levels*.