



# Global Infrastructure Hub

## Innovative Funding and Financing

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A G20 INITIATIVE



## Note to the reader

**In October 2019, the GI Hub began work on the three topic areas defining the GI Hub's Pillar Four priority topics**


- This document focuses on the *"Innovative Funding and Financing"* topic within Pillar Four

**These materials provide a novel typology for innovation in funding and financing combined with a case-study library**

- Case-study library summarizing 50 examples of innovative funding and financing practices, organized around a novel typology for innovation
- Catalogue of 38 case-study deep-dives detailing their respective innovations, impacts and lessons learned

**Additional insights related to this study are found in a supporting document**

- A scan of the global infrastructure investment industry assessing the state of the private markets for infrastructure, the challenges constraining the market and the actions governments can take to address the challenges



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Innovative Funding and Financing Typology

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Case Study Catalogue

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Case Study Deep-Dives





# Table of Contents



Innovative Funding and Financing Typology

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Case Study Catalogue



Case Study Deep-Dives



## Three lever types are critical to create strong, predictable projects capable of attracting the capital needed to develop a PPP



### Revenue Levers

- Fundamental source of project funding
- Defined by five potential revenue sources



### Risk Management Levers

- Source of certainty for investors
- Defined contractually and in financial instruments



### Financing Levers

- Source of liquidity to commence operations
- Defined across range of primary and secondary sources



Fundamental value created by a project that drives resilience of the business case

Manages the risk-reward balance of the project structure

Provides the liquidity needed to initiate the project

Project Initiation


Project  
Timeline

Financial Close

**Together the three categories of levers define the private participation in infrastructure toolbox**



# A project's revenue mechanism is the core driver of business performance

 Revenue Levers	Lever Description	Lever Options <sup>1</sup>
Tax-Based	<ul style="list-style-type: none"> <li>A core payment mechanism for infrastructure drawn from the public fiscus and, generally, structured as a payment stream with a lower risk rating (depending on credit rating) than revenue streams exposed to degrees of commercial risk</li> </ul>	<ul style="list-style-type: none"> <li>Availability Payment</li> <li>Shadow toll</li> <li>Tax-Breaks</li> </ul>
User-Based	<ul style="list-style-type: none"> <li>A core payment mechanism transferring varying degrees of commercial risk to the private sponsor of an infrastructure asset (in a pure concession model) enabling the operator to directly charge customers for services (within the bounds of the regulatory regime for user tariffs)</li> </ul>	<ul style="list-style-type: none"> <li>Toll Revenues</li> <li>Tariffs on Regulated Utilities</li> <li>Unitary pricing</li> <li>Segment Pricing</li> <li>Dynamic Pricing</li> </ul>
Ancillary Revenue	<ul style="list-style-type: none"> <li>A secondary revenue stream designed to complement the core revenue (tax-based or user-based) by extending the scope of services provided by private sponsors to services supporting or complementing core operations</li> <li>Application often driven by structural features of an asset, urban densities surrounding the asset, income levels of users and ability of project designers to build incentives for sponsors to offer non-core services</li> </ul>	<ul style="list-style-type: none"> <li>Advertising</li> <li>Real Estate Revenues</li> <li>Energy solutions</li> <li>Maintenance and repair services</li> <li>Commercial Retail Revenues</li> <li>Parking Revenues</li> </ul>
Value Capture	<ul style="list-style-type: none"> <li>A secondary revenue stream for infrastructure relying on the "capturing" of spillover value created by an infrastructure asset</li> <li>The mechanism for "value capture" may vary widely, but general practice relies on forms of targeted taxation, levies and rates on spatial zones surrounding infrastructure assets in urban locations</li> </ul>	<ul style="list-style-type: none"> <li>Special District Taxation</li> <li>Betterment Levies</li> <li>Developer Charges</li> <li>Stamp Duties</li> <li>Tax Increment Financing (TIF)</li> <li>Real Estate Taxation</li> <li>General property tax</li> </ul>
Data	<ul style="list-style-type: none"> <li>Revenue collected from the monetization of data generated by an infrastructure asset</li> <li>This is the least mature revenue lever</li> </ul>	<ul style="list-style-type: none"> <li>Operational data</li> <li>Consumer data</li> </ul>

1. List is non-exhaustive




# Risk management levers can improve revenue and return certainty

 Risk Management Levers	Lever Description	Lever Options <sup>1</sup>
Profit-Sharing Agreements	<ul style="list-style-type: none"> <li>An agreement that stipulates distribution of profits from the asset to specific parties under given scenarios (generally return scenarios)</li> </ul>	Profit-Sharing Agreement <ul style="list-style-type: none"> <li>Cap and Collar</li> <li>Cap Only</li> </ul>
Political/Performance Guarantees	<ul style="list-style-type: none"> <li>Protection against losses resulting from a failure of a sovereign, sub-sovereign, or state-owned enterprise for not honoring contractual obligations (excluding payment obligations)</li> <li>Political guarantees and/or political comfort are provided by MDBs and governments to promote foreign direct investments in emerging markets</li> </ul>	<ul style="list-style-type: none"> <li>Expropriation</li> <li>War, Terrorism and Civil Disturbance</li> <li>Breach of Contract</li> <li>Change/sale of ownership restrictions</li> <li>Step-in rights</li> <li>Performance bond</li> <li>Security over assets</li> </ul>
Volume Guarantees	<ul style="list-style-type: none"> <li>Formal assurances that a party will receive a minimum level of revenue during a concession period</li> <li>Volume guarantees mitigate demand risk and allow investors to gain enough revenue to repay high initial investment costs for long-term concessions</li> </ul>	Volume Guarantees <ul style="list-style-type: none"> <li>Minimum Volume-Based Guarantee</li> <li>Minimum Revenue Guarantee</li> </ul>
Financial Guarantees	<ul style="list-style-type: none"> <li>Protection against losses resulting from a failure of a sovereign, sub-sovereign, or state-owned enterprise to make a payment when due under an unconditional financial payment obligation or guarantee</li> <li>Available to cover range of risks including those linked to payment obligations (defined as a credit enhancement product)</li> </ul>	Financial Guarantees <ul style="list-style-type: none"> <li>Non-Honoring of Financial Obligations</li> <li>Currency Inconvertibility and Transfer Restrictions</li> <li>Condition precedent clauses</li> <li>Bank guarantee/letter of credit</li> </ul>
Hedging	<ul style="list-style-type: none"> <li>An investment position intended to mitigate currency risk in the event of downward exchange rate scenario</li> <li>Hedging instruments are integral for foreign institutional investors and insurers in markets with high FX-risk</li> </ul>	Hedging <ul style="list-style-type: none"> <li>Long-Duration Swaps (&gt;5 years)</li> <li>Short-Duration Swaps (&lt;5 years)</li> </ul>
Pre-Completion Insurance	<ul style="list-style-type: none"> <li>An arrangement where one entity provides formal assurances of guaranteed compensation in the event of specified losses, damages or delays</li> <li>Insurance mitigates execution risks for investors, but may be expensive particularly in emerging markets and for greenfield projects</li> </ul>	Insurance <ul style="list-style-type: none"> <li>Various insurance (Construction-All-Risk; Delay-in-startup insurance etc.)</li> </ul>

1. List is non-exhaustive



# Primary direct financing is the crucial capital flow in a PPP project (I/II)


 Primary Financing Levers	Lever Description	Lever Options <sup>1</sup>
Direct		
Commercial Bank Loans	<ul style="list-style-type: none"> <li>Long-term debt products are essential to infrastructure projects with commercial banks acting as a primary channel for loans secured against project cash-flows (project finance) or corporate balance sheets (corporate finance)</li> <li>Maturity of domestic banking market and internal risk management capacity drives the formation of project finance products</li> </ul>	<ul style="list-style-type: none"> <li>Senior Long-Dated Facility</li> <li>Partial/Full-Recourse Loans</li> <li>Bridge Loans</li> <li>Equity bridge financing</li> </ul>
MDB/ECA/NDB Debt	<ul style="list-style-type: none"> <li>Multilateral Development Banks (MDBs) are prominent sources of corporate and project debt in emerging markets for governments and private sponsors</li> <li>Export Credit Agencies (ECAs) can provide debt and risk management solutions to project sponsors if specific conditions are met around the usage of capital and goods from the ECA's home market</li> <li>National Development Banks (NDBs) provide a range of debt products to infrastructure projects that vary greatly according to entity mandate, rating etc.</li> </ul>	<ul style="list-style-type: none"> <li>"A" and "B" Loans</li> <li>Subordinated Debt</li> <li>Vendor Financing &amp; export credit</li> <li>Mezzanine Financing</li> <li>Local Currency Loans</li> </ul>
Government Debt	<ul style="list-style-type: none"> <li>Government is commonly viewed as the provider of the "1st dollar" or the "last dollar" by using public debt in specific circumstances to fill liquidity gaps or to positively impact the business cases of strategic projects</li> <li>Government debt should act as a complement to private debt sources</li> </ul>	<ul style="list-style-type: none"> <li>Concessional Loans (all structures)</li> </ul>
Direct Equity Institutional	<ul style="list-style-type: none"> <li>Institutional investors are a foundational source of equity for the infrastructure markets with an increasing number investing equity directly into project structures</li> <li>Given currency fluctuation risk and high standards of fiduciary duties, domestic institutional are likely the main source of direct institutional equity investment</li> </ul>	<ul style="list-style-type: none"> <li>SPV Equity Contribution</li> <li>JV Equity Contribution</li> <li>Private Sale</li> </ul>
Direct Equity Operating	<ul style="list-style-type: none"> <li>Operators are a foundational source of equity for the infrastructure markets providing the unique combination of capital and operating capabilities</li> </ul>	<ul style="list-style-type: none"> <li>SPV Equity Contribution</li> <li>JV Equity Contribution</li> <li>Private Sale</li> </ul>
Government Equity	<ul style="list-style-type: none"> <li>Government equity is an evolving product that can function as, both, a potential subsidy and a traditional equity contribution</li> <li>Like government debt, government equity is viewed as a "1st dollar" or "last dollar" strategy to catalyze participation from private financing sources</li> </ul>	<ul style="list-style-type: none"> <li>Transferrable Capital Contribution</li> <li>Transferrable Operating Contribution</li> </ul>

1. List is non-exhaustive






# Primary direct financing is the crucial capital flow in a PPP project (II/II)

 <b>Primary Financing Levers</b> Listed	Lever Description	Lever Options <sup>1</sup>
Securitized Debt	<ul style="list-style-type: none"> <li>• Tradable securities backed by the cash-flows of pooled debt from a portfolio of infrastructure projects</li> <li>• Provides investors a platform to gain exposure to debt of operating assets without taking a direct position in the project's structure</li> </ul>	Securitized debt <ul style="list-style-type: none"> <li>• Collateralized Loan Obligations (CLOs)</li> </ul>
Project Bonds	<ul style="list-style-type: none"> <li>• Fixed income instruments sold to investors whose proceeds are used to provide debt to an infrastructure project</li> <li>• Project bonds are tradable, rated and directly linked to the cash-flow of individual projects</li> </ul>	Project bonds <ul style="list-style-type: none"> <li>• With credit enhancement</li> <li>• Backed by cash flow only</li> <li>• Private activity bonds</li> </ul>
Government and General Obligation bonds	<ul style="list-style-type: none"> <li>• Fixed income instruments backed by the issuing jurisdiction's general budget rather than the revenue of the project</li> <li>• Bonds issued by central and local government bodies with borrowing rates dictated by issuers credit rating and degree of explicit sovereign support</li> <li>• Government and General Obligation bonds vary widely, but are often feature tax-exemptions catalyzing investment from investors</li> </ul>	Government and General Obligation (G.O.) bonds <ul style="list-style-type: none"> <li>• Municipal Bonds (eg. Limited tax bonds)</li> <li>• Green Bonds</li> <li>• Islamic Bonds</li> <li>• Revenue bonds</li> </ul>
Listed Security Investments	<ul style="list-style-type: none"> <li>• Tradable equity securities sold to investors on the stock exchange</li> <li>• Return of these securities may exhibit higher correlation with other public equities, but provides investors greater transparency and liquidity than private market equity</li> </ul>	Listed security investments <ul style="list-style-type: none"> <li>• Public Asset IPO</li> <li>• Corporate Securities (Standard)</li> </ul>
Listed Trust Investments	<ul style="list-style-type: none"> <li>• A collective investment scheme into a portfolio of projects enabling investors to hold tradable equity securities linked directly to projects</li> <li>• Acts as a "white label" platform to aggregate operating assets with stable yield profiles across sectors and geographies</li> </ul>	Listed trust investments <ul style="list-style-type: none"> <li>• Infrastructure Investment Trusts (InvITs)</li> <li>• YieldCo</li> <li>• Real Estate Investment Trusts (REITs)</li> </ul>
Listed Infrastructure Funds	<ul style="list-style-type: none"> <li>• Listed infrastructure funds invest in the shares of publicly listed companies which own and operate infrastructure assets</li> <li>• These funds have better liquidity and transparency as they are marked-to-market</li> </ul>	<ul style="list-style-type: none"> <li>• Listed infrastructure investments</li> </ul>

1. List is non-exhaustive



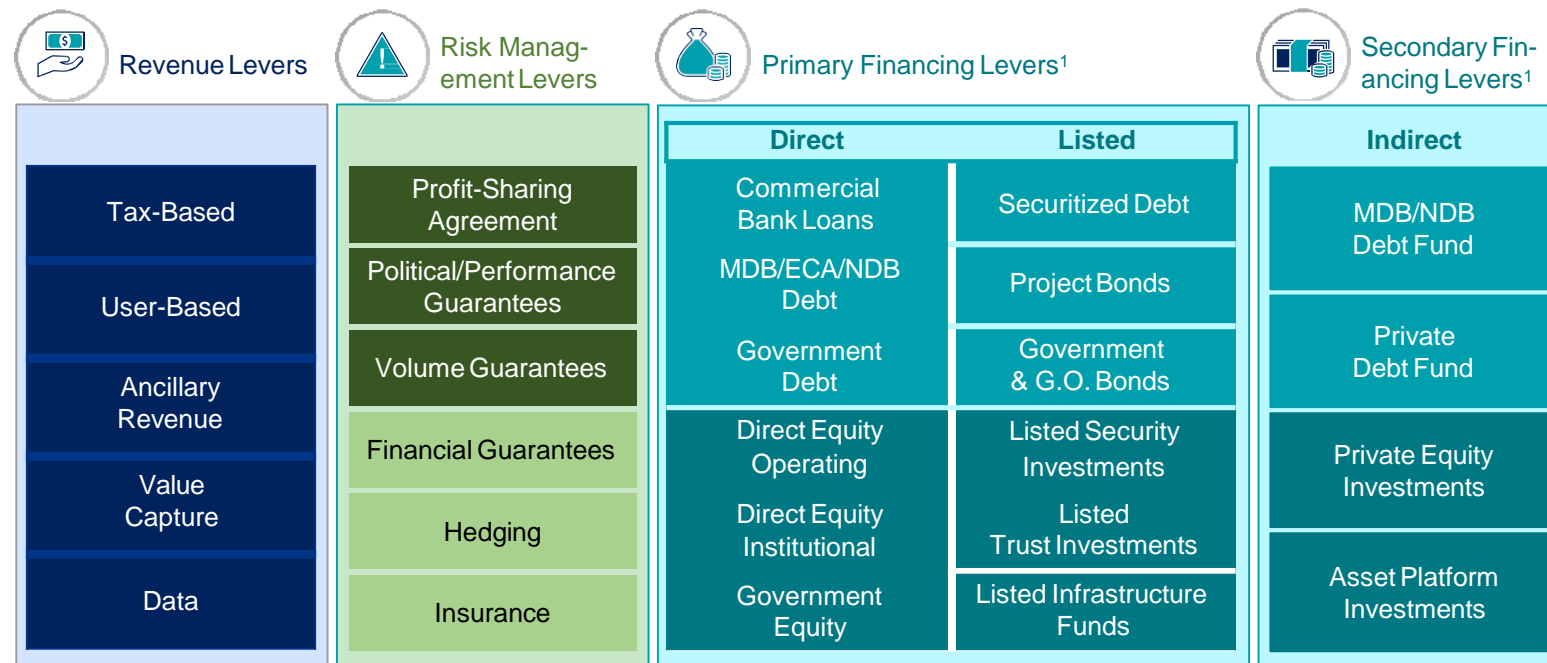
# Secondary financing levers serve as the intermediaries that can access the primary (direct and listed) levers

 Secondary Financing Levers	Lever Description	Lever Options <sup>1</sup>
MDB/NDB Debt Fund	<ul style="list-style-type: none"> <li>• Syndication platforms that create diversified portfolios of emerging market private sector loans enabling increased exposure or first-time entry into the asset class</li> <li>• MDB debt funds help investors overcome challenges in sourcing viable investment opportunities in emerging markets by delegating the selection, appraisal and supervision of investments to deeply experienced MDB investors</li> </ul>	MDB debt fund <ul style="list-style-type: none"> <li>• Co-Lending Facility</li> </ul>
Private Debt Fund	<ul style="list-style-type: none"> <li>• Unlisted funds that pool money from institutional investors and provide debt to infrastructure projects (often substituting commercial banks)</li> <li>• Private debt funds have fewer regulatory constraints and less internal bureaucracy than commercial banks, enabling them to provide debt with fewer covenants</li> </ul>	Private debt fund <ul style="list-style-type: none"> <li>• Co-Lending Facility</li> <li>• Conventional Project Loans</li> <li>• Mezzanine Project Loans</li> </ul>
Private Equity	<ul style="list-style-type: none"> <li>• Unlisted infrastructure funds pool money from institutional investors for equity investment in infra-projects seeking returns over various horizons</li> <li>• Funds enable their Limited Partners (LPs) to gain exposure directly to project capital structures without the need for building in-house investment capabilities</li> <li>• These funds do not invest in all markets as they are constrained by LP requirements and project alignments with targeted risk weighted returns</li> </ul>	Private equity investments <ul style="list-style-type: none"> <li>• General Project Equity (SPV or JV)</li> <li>• General Project Equity Co-Investment (SPV or JV)</li> <li>• Open-Ended Structure</li> <li>• Securitised loans</li> </ul>
Asset Platform Investments	<ul style="list-style-type: none"> <li>• Platforms that aggregate infra-assets of a specific criteria and allow investors to purchase equity in that portfolio</li> <li>• Asset platform investments give investors exposure to specific asset types while diversifying away some risk by holding equity in multiple assets</li> </ul>	Asset platform investments <ul style="list-style-type: none"> <li>• Asset HoldCo JV</li> </ul>

1. List is non-exhaustive



Together the three lever categories (revenue, risk management and financing) define the toolbox for private participation in infrastructure



■ Contractual

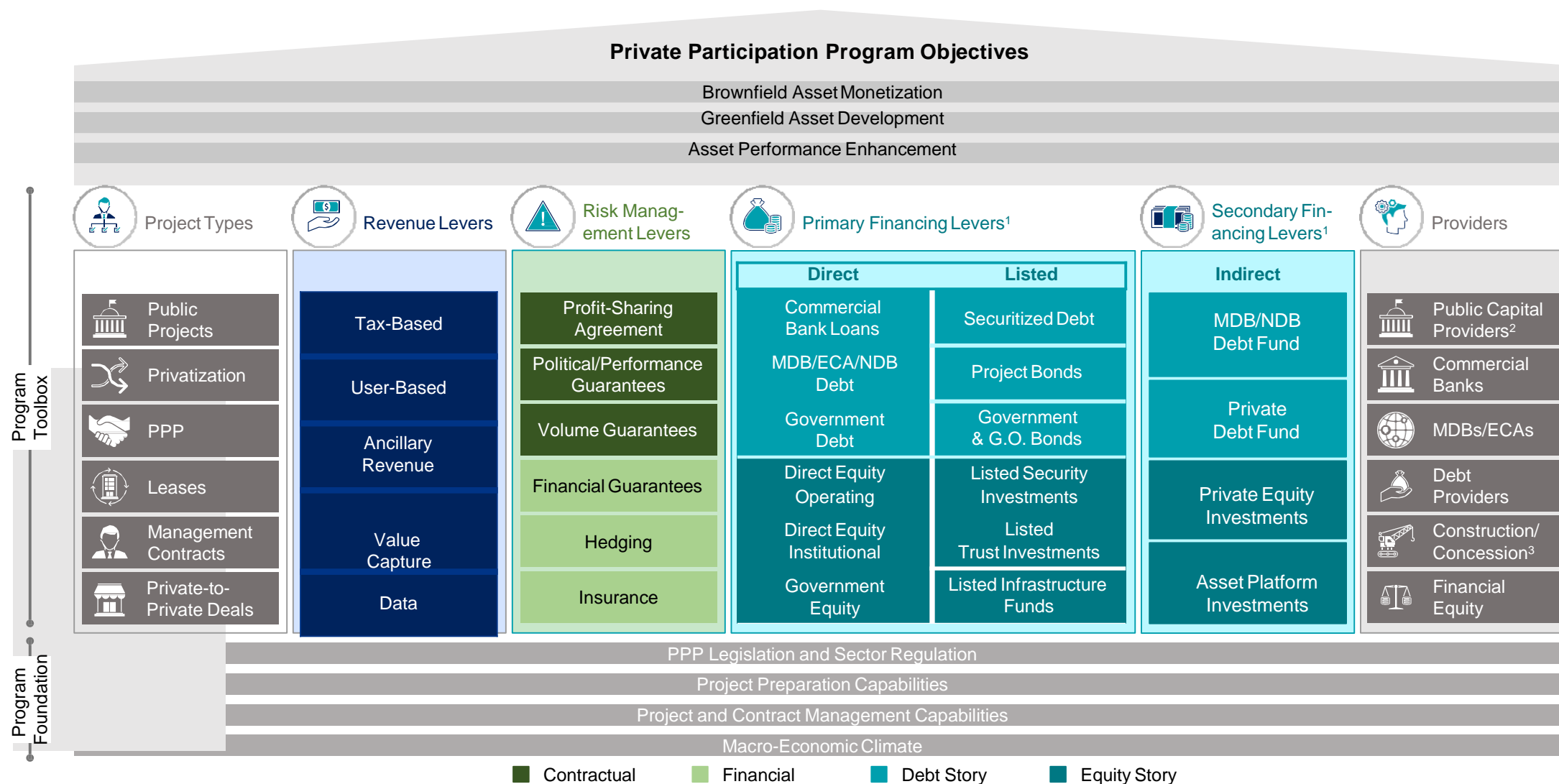
■ Financial

■ Debt Story

■ Equity Story

1. For simplicity, Funds of Funds were not considered an explicit category

# A government's ability to use the toolbox depends on numerous enablers

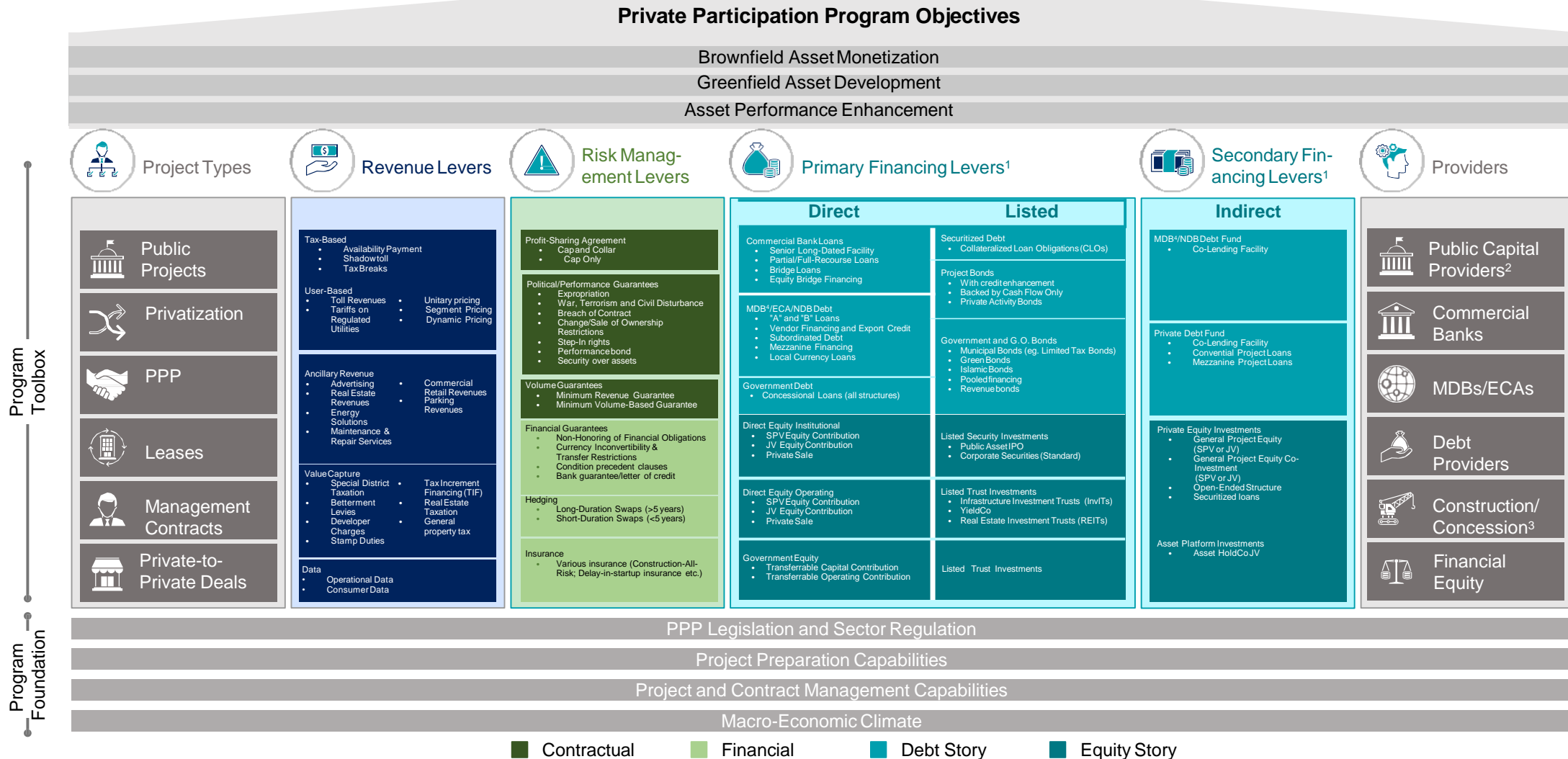


1. For simplicity, Funds of Funds were not considered an explicit category 2. Category defines equity and debt instruments provided by entities underwritten by the public fiscus 3. Concessionaires 4. De-risking impacts from financial solutions offered by MDBs (e.g. the "halo effect" from MDB project loans) result in interactions between the "Risk Management Levers" and "Primary Financing Levers"



# Within the "toolbox" are a comprehensive set of "tools" to affect projects

Typology



1. For simplicity, Funds of Funds were not considered an explicit category 2. Category defines equity and debt instruments provided by entities underwritten by the public fiscus 3. Concessionaires 4. De-risking impacts from financial solutions offered by MDBs (e.g. the "halo effect" from MDB project loans) result in interactions between the "Risk Management Levers" and "Primary Financing Levers"

A "tool's" use can be considered innovative in three ways



### Frontier-Traversing

Refinement of best-practice



### Frontier-Extending

First time application in a new market



### Frontier-Breaking

First of its kind globally



52 innovative project examples are catalogued across the three lever-types



Revenue

Projects that employed innovative mechanisms to fund infrastructure across sectors



Risk-Management

Projects that innovatively mitigated risk for private sector infrastructure investors<sup>1</sup>



Financing

Projects that found an innovative means to successfully raise debt and equity<sup>2</sup>



1. Includes one global risk-management example by the International Finance Corporation (IFC) 2. Includes one Africa-wide example by the Africa Development Bank (AfDB)

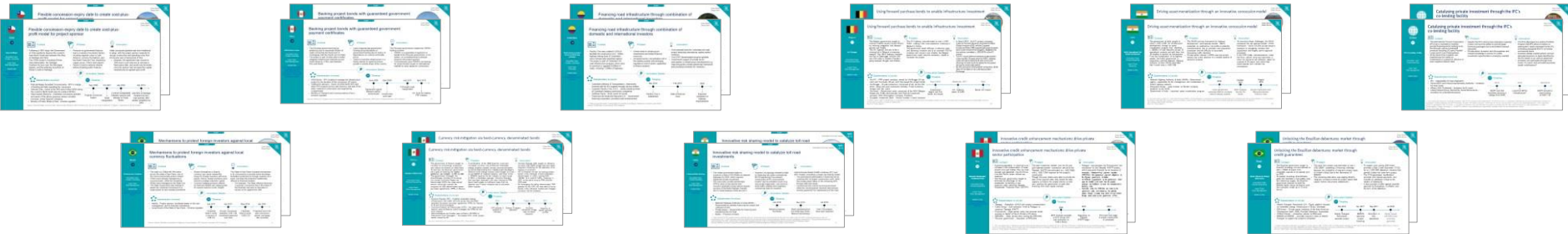
# From the catalogue of 50 projects, 38 deep-dives are available



Revenue



Risk Management



Financing







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Innovative Funding and Financing Typology

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Case Study Catalogue

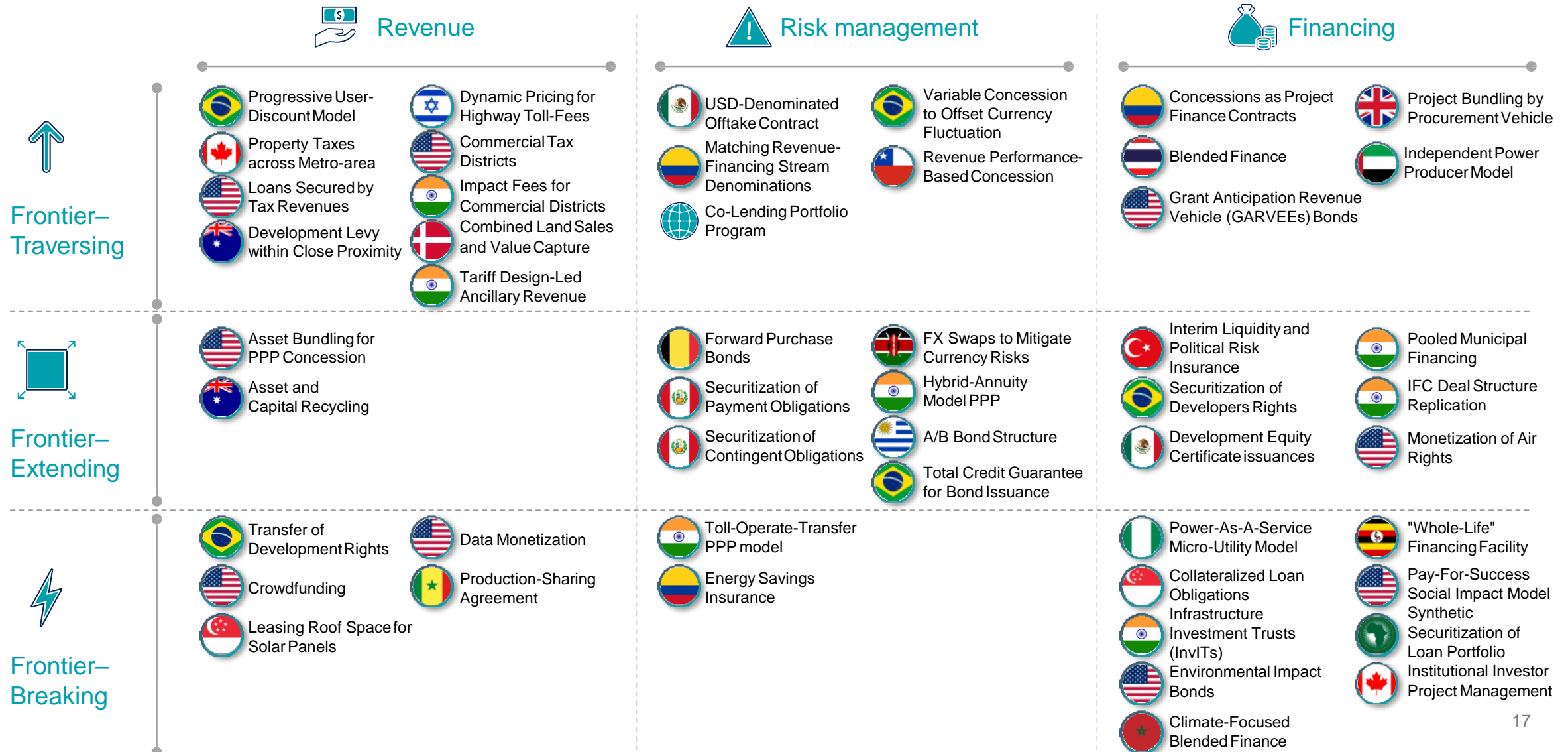
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Case Study Deep-Dives



















We identified 50 leading examples are identified across geographies and mapped according to the previously presented typology





# Case-studies were explored across levers and innovation types (I/X)

★ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 Brazil	Piracicaba-Panorama Highway Concession USD 3.7B (2019) Brownfield	<ul style="list-style-type: none"> <li>★ The 1,200km Piracicaba-Panorama highway concession is one of the largest highway concessions in Brazil and is part of the government's state privatization program</li> <li>Highway adopts a progressive user-pay discount model that attempts to capture drivers with lower willingness to pay who may use alternative routes, while also ensuring higher volume private commuters stay loyal to the route</li> </ul>		
 Canada	Millennium Line Broadway Extension USD 2.1B (2019) Greenfield	<ul style="list-style-type: none"> <li>★ The Millennium Line Broadway Extension is part of TransLink's 2018-2027 investment plan (Phase II)</li> <li>A portion of property taxes collected in Metro Vancouver covering 21 municipalities are used to support transit infrastructure, for TransLink's investment plan, an additional property tax of USD4.1 per average household was applied amongst other measures such as development cost charge and motor fuel tax</li> </ul>		
 USA	Dulles Corridor Metrorail USD 5.8B (2011) Greenfield	<ul style="list-style-type: none"> <li>★ The 23-mile Silver Line extension of the current Metrorail system was funded by various sources including toll revenues, taxes and federal grants</li> <li>Based on expected benefits to Fairfax County and Loudoun Count, the taxpayers of the two counties will contribute close to 21% of total project costs</li> </ul>		
 India	Nehru Outer Ring Road Monetization USD 1.1B (2018) Brownfield	<ul style="list-style-type: none"> <li>★ The Hyderabad Metropolitan Development Authority (HMDA) is developing a 2,170km square growth corridor with a width of 5km on each side of the 162km Outer Ring Road (ORR) around Hyderabad</li> <li>A levy fee is charged on new developments within the 1km wide Growth Corridor (GC) on both sides of the ORR, with such impact fees being higher for commercial areas and taller buildings</li> </ul>		
 Denmark	Copenhagen Metro M1 USD 2.0B (2007) Greenfield	<ul style="list-style-type: none"> <li>★ The metro line connecting downtown Copenhagen to the airport was opened in 2007 and aimed to spur the development of Ørestad. It was delivered by the Ørestad Development Corporation (ODC), owned by the City of Copenhagen (55%) and the Danish State (45%)</li> <li>The metro was financed through the sale of land, with the ODC having the authority to develop and sell land for housing, offices, retail and schools</li> </ul>		
 Australia	Parramatta Light Rail USD 3.0B (2013) Greenfield	<ul style="list-style-type: none"> <li>★ Construction of two light rail lines totalling 21km was funded by a "value sharing" model</li> <li>An annual "special levy" of c. USD 72 was applied to residential and commercial development within 800 metres of rail stops (for a period of 30 years) as well as a 3% land tax on the value of properties in the same areas</li> </ul>		



Revenue



Risk Management





















Financing

Frontier  
TraversingFrontier  
ExtendingFrontier  
Breaking



# Case-studies were explored across levers and innovation types (II/X)

★ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 India	Ancillary Revenue through Tariff Design USD 1.5B (2008) Greenfield	★ <ul style="list-style-type: none"> <li>The Kempegowda International Airport was the first airport to be delivered by PPP, and employed the India Airport Economic Regulatory Authority's (AERA) standardized airport tariff structures</li> <li>The airport tariff structure limited the operator's earnings to 15% NPV of overall airport revenues, with 100% of aero-related profits and only 30% of non-aero-related profits contributing to the cap; this structure incentivised operators to drive non-aero profits in airports</li> </ul>		
 USA	Tax-Based Revenue at Denver Union Station USD 500M (2006) Brownfield	★ <ul style="list-style-type: none"> <li>The Denver Union Station is a large-scale, mixed-use development project that transformed the old Denver Union Station into a modern district</li> <li>It was funded by a mix of federal and state government loans. These loans were to be paid by revenues generated from an increase in ridership as well as taxes</li> </ul>		
 Israel	Tel Aviv Fast Lane USD 227M (2011) Greenfield	<ul style="list-style-type: none"> <li>Tel Aviv's Fast Lane is an innovative, dynamic tolling system that is able to predict traffic volumes and vary rates based on current road usage and congestion levels</li> <li>The fast lane connects the Shappirim interchange to Tel Aviv and incentivises car-pooling through its dynamic tolls, effectively minimising congestion and reducing traffic by 8,000 cars per day</li> </ul>		
 USA	Pennsylvania Rapid Bridge Replacement P3 USD 1.0B (2015) Greenfield	★ <ul style="list-style-type: none"> <li>Plenary Group was awarded a contract to replace 558 bridges in Pennsylvania as part of a Design-Build-Finance-Maintain (DBFM) bundled project</li> <li>Bundling creates efficiencies through economies of scale and facilitates application of asset management best practices throughout the concession period</li> </ul>		
 Australia	Transgrid Privatization USD 7.0B (2015) Brownfield	★ <ul style="list-style-type: none"> <li>In 2015, NSW Electricity Networks was awarded the rights to lease Transgrid for a period of 99 years by the New South Wales (NSW) state government</li> <li>Gross proceeds from the lease transaction will be used to fund parts of the infrastructure strategy, and as a consequence of the lease, the state of New South Wales was eligible for a payment of USD 680M from the Commonwealth Government, under the Asset Recycling Initiative</li> </ul>		
 Brazil	III Perimetral Ave in Porto Alegre USD 53M (2006) Greenfield	★ <ul style="list-style-type: none"> <li>Development of the Avenida Perimetral, which includes tracks for Bus Rapid Transit (BRT) services, required the Municipality of Porto Alegre to acquire land within Porto Alegre</li> <li>Land for developing Avenida Perimetral was acquired by compensating property owners with development rights that could be used elsewhere in the city; 50% of the land cost (USD 9.8M) was covered by Transfer of Development Rights, representing 65% of the land acquired</li> </ul>		



Revenue



Risk Management



Financing



Frontier  
Traversing



Frontier  
Extending















Frontier  
Breaking





# Case-studies were explored across levers and innovation types (III/X)

★ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 Singapore	Solar Leasing Model USD 3.7B (2019) Brownfield	<ul style="list-style-type: none"> <li>Port of Singapore (PSA) leases the rooftop of its warehouse building to Sunseap Leasing, which finances, installs, operates and maintains solar panels on the warehouse</li> <li>Sunseap Leasing sells electricity generated to PSA, and is also able to sell excess electricity generated back into the grid to the government owned electricity distributor</li> </ul>		
 USA	Lowline USD 80M (2012) Brownfield	★ <ul style="list-style-type: none"> <li>Transformation of NY train station into underground public park funded by USD 150k on Kickstarter</li> <li>Crowd-sourced funding from the general public can be used to deliver small-scale, municipal-level infrastructure projects</li> </ul>		
 USA	LinkNYC USD 200M (2015) Brownfield	★ <ul style="list-style-type: none"> <li>Transformation of 8,400 of New York City's existing payphones which were being underutilized</li> <li>Project was funded purely by a private consortium with returns being generated through data monetization and advertising revenue and the city benefiting through a revenue sharing agreement</li> </ul>		
 Senegal	Senergy PV plant USD 39.5M (2014) Greenfield	<ul style="list-style-type: none"> <li>Revenues for the solar PV power plant are generated by a 25 year power purchase agreement (PPA) with the national utility (Senelec) backed by the Government of Senegal on a take-or-pay basis</li> <li>Developed by Senergy Suarl (the original developer of the project with 15% equity ownership), FONSIS (32% equity ownership) and Meridiam (53% equity ownership) under a partnership model similar to a "production sharing agreement" with Meridiam leading the project</li> </ul>		



Revenue



Risk Management



Financing



Frontier  
Traversing



Frontier  
Extending





















Frontier  
Breaking



# Case-studies were explored across levers and innovation types (IV/X)

☆ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 Mexico	Oaxaca II Wind Farm USD 148.5M (2012) Greenfield	☆ • The 102MW wind farm project is granted by the Mexican Federal Electricity Commission (CFE) and developed by Acciona • Oaxaca II was one of the first renewable projects in Latin America to tap international capital markets through the issuance of project bonds by employing a USD-denominated Power Purchase Agreement (PPA) with CFE, allowing investors to mitigate currency and other economic risks		
 Chile	Ruta del Maipo Concession USD 706M (1999) Greenfield	☆ • The project involves the construction, maintenance and operation of a 237km highway by Ferrovial • Concession period for the Ruta del Maipo toll road is not fixed, and is based on the project's cumulative revenue performance (i.e., the concession ends when the present value of actual revenues equals a pre-agreed target value) mitigating revenue risk in the event of downside scenarios		
 Colombia	Conexión Pacífico 3 Highway USD 750M (2016) Greenfield	☆ • Colombia's Pacifico Tres Toll Road project is a 213km road under the government's 4G program • Project is secured under a multi-tranche, dual-currency, hybrid financing package equivalent to USD 650M and addresses currency mismatch risk by allocating issuance amounts proportionally to the project's revenue stream denominations (60% local currency toll and 40% USD-denominated availability and true-up payments)		
 Brazil	Rodovia dos Calçados (Itaporanga-Franca) USD 1.4B (2019) Brownfield	☆ • The Itaporanga-Franca concession encompasses the duplication, improvement, and maintenance of 720km of highways across two distinct segments of the Rodovia dos Calçados • Exchange-rate protection mechanisms were put in place and in the event of currency devaluation greater than 5%, the value of concession fees would be reduced to offset the weakening of the Reais		
 Global	MCPP Co-Lending Facility USD 1.6B (2016)	☆ • The IFC's Managed Co-Lending Portfolio Program (MCPP) allows private investors to participate in deals that the IFC originates • The MCPP allows investors to increase exposure or gain-first time access to infrastructure in Emerging Markets (EMs) through deals originated with IFC's deep EM expertise		
 Belgium	A11 Bruges-Zeebrugge Road USD 1.5B (2014) Greenfield	☆ • The A11 project is a 55km motorway delivered by the Via Brugge consortium, which was awarded the 30-year Design-Build-Finance-Maintain (DBFM) contract • The project was partially financed by forward purchase bonds, which are issued with a forward commitment to purchase them at a pre-agreed schedule, based on construction financing requirements; this deferred drawdown structure helps mitigate the cost of carry		



Revenue



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














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# Case-studies were explored across levers and innovation types (V/X)

☆ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 Brazil	Santa Vitoria do Palmar WindFarm USD 307.8M (2017) Greenfield	<ul style="list-style-type: none"> <li>Development of the 207MW Santa Vitoria do Palmar wind farm was partially financed by a USD 24.5M bond issuance in the local market guaranteed by IDB Invest (known as a Total Credit Guarantee)</li> <li>Bondholders are guaranteed the payment of principal and interest during the life of the bond (a "full wrap"), which significantly lowers the cost of the issuance, increases the tenor of the bond (up to 13.5 years) and boosts investor appetite</li> </ul>		
 Peru	IIRSA Norte Tramo (Stretch 1 & 2) USD 681M (2006) Greenfield	<ul style="list-style-type: none"> <li>The project involves the rehabilitation, expansion, operation and maintenance of a 955km tollroad</li> <li>More than USD 200M was financed through project bonds secured with CRPAOs issued by the Ministry of Transport and Communication. Each CRPAO constitutes an unconditional and irrevocable payment obligation of the government of Peru (denominated in US dollars) and is used for credit enhancement</li> </ul>		
 Peru	Taboada Wastewater Treatment Plant USD 310M (2008) Greenfield	<ul style="list-style-type: none"> <li>The wastewater plant project was awarded to Tedagua under a 25-year, build, finance, operate and maintain contract, and will have an installed capacity of 442M cubic meters per annum</li> <li>USD 310M was raised through project bonds by securitizing RPICAOs issued by the state owned utility. RPICAOs are contingent obligations of the Peruvian government (denominated in US dollars) to reimburse the concessionaire based on construction completion milestones</li> <li>Unlike CRPAOs, RPICAOs do not represent payment obligations by the government, but serve as a guarantee in the event that project funds are insufficient to cover the concessionaire's financing costs</li> </ul>		
 India	Chandikhole-Bhadrak Section of NH-5 USD 245M (2018) Brownfield	<ul style="list-style-type: none"> <li>The road project involves the rehabilitation of 74.5km of national highways</li> <li>The project was delivered under the (Hybrid-Annuity Model) HAM model, where the government contributes 40% of the project cost over the first 5 years of the project through annual payments, while the remaining 60% of the project is financed by the private player in the form of equity or loans, the government retains ownership of the highway and takes on tolling responsibilities</li> </ul>		
 Kenya	Long-Term Foreign Exchange Risk Management USD 85M	<ul style="list-style-type: none"> <li>In conjunction with the IFC, the Currency Exchange Fund (TCX) Fund provides long-term, fixed and inflation linked, cross currency swaps and interest rate swaps to beneficiaries undertaking climate-relevant investments</li> <li>The TCX Fund supported M-KOPA (based in Kenya), a start-up tackling poverty and access to affordable and clean energy by providing solar home with more than 500k low income households in East Africa</li> </ul>		



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# Case-studies were explored across levers and innovation types (VI/X)

★ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 India	NHAI Operational Toll Road Concession Pilot Bundle - Auction 1 USD 1.5B (2018) Brownfield	★ <ul style="list-style-type: none"> <li>The Toll Road Concession Pilot Bundle (Auction 1) was the first bundle of highway projects to be auctioned under the Toll-Operate-Transfer (TOT) model</li> <li>The TOT model allows the government to raise funds for new projects by monetizing existing assets through a 30 year concession period, which reduces construction risks for private investors during construction, while relieving the government of tolling and operations and maintenance obligations</li> </ul>		
 Colombia	Energy Savings Insurance (2019) Greenfield	<ul style="list-style-type: none"> <li>Energy Savings Insurance (ESI) addresses investment barriers for energy efficiency upgrades by providing insurance payouts if the projected value of energy savings is not met</li> <li>The technology solution provider pays the insurer premium, with coverage for Small and Medium Enterprises (SMEs) purchasing energy efficient tech solutions</li> </ul>		



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# Case-studies were explored across levers and innovation types (VII/X)

★ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 Colombia	Transversal del Sisga Highway Corridor USD 337M (2018) Greenfield	<ul style="list-style-type: none"> <li>The project involves the expansion and maintenance of 137km of highways and is part of the second wave of projects under the 4G program; much of the project debt (USD 166.4M) came from Blackrock and Ashmore-CAF loans after the government enacted a new procurement law</li> <li>The procurement law treats concessions as project finance contracts instead of corporate contracts, making it simpler to acquire land and created clear guidelines for concession cancellations</li> </ul>		
 USA	Gilcrease Expressway WestP3 USD 260.9M (2019) Greenfield	★ <ul style="list-style-type: none"> <li>The project involves the construction of a 4-lane, 8km highway and a bridge over the Arkansas River and is partially financed by Grant Anticipation Revenue Vehicle (GARVEEs) bonds (USD 65.5M)</li> <li>GARVEEs are tax-exempt bonds sold by the state government which are repaid with future federal-aid highway funding, enabling the state to accelerate construction timelines and spread the cost over its useful life rather than just the construction period</li> </ul>		
 Thailand	Korat 18MW Solar Power USD 50M (2012) Greenfield	★ <ul style="list-style-type: none"> <li>To develop a utility scale solar PV power plant in Thailand, the IFC provided an USD 8M loan, which was “blended” with USD 4M in concessional financing from the Clean Technology Fund</li> <li>The IFC loan allowed the project company to mobilize enough capital from three local banks to develop two power plants with 12 MW of aggregate capacity</li> </ul>		
 UAE	Mohammed bin Rashid Solar Parks USD 13.6B (2014) Greenfield	<ul style="list-style-type: none"> <li>The Mohammed bin Rashid Solar Park is the largest single-site solar park in the world; it uses an Independent Power Producer (IPP model)</li> <li>The park has gradually increased its capacity through five phases between Q3 2014 and Q4 2021, so that it will eventually reach 5GW by 2030 with a total planned investment of USD 13.6B</li> </ul>		
 UK	Local Improvement Finance Trust (LIFT) USD 2.8B (2014) Greenfield and Brownfield	★ <ul style="list-style-type: none"> <li>The UK's Local Improvement Finance Trust (LIFT) is a procurement vehicle for public private partnerships aimed at rejuvenating old, and building new, health facilities across England</li> <li>LIFT partnerships finance, deliver, manage and maintain health estates by bundling multiple small projects across a given area or region, creating scale needed to attract private investment</li> </ul>		
 Turkey	Elazig Integrated Health Campus PPP USD 381.9M (2016) Greenfield	★ <ul style="list-style-type: none"> <li>Development of the Elazig hospital PPP is part of the Turkish government's Health Transformation Programme and was partially financed by a project bond issuance amounting to USD 320M</li> <li>Credit enhancements through EBRD's provision of USD 99M as interim liquidity (mitigating construction and operation risks) as well as MIGA's political-risk insurance helped unlock investors for the issuance</li> </ul>		



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# Case-studies were explored across levers and innovation types (VIII/X)

★ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 Uruguay	Jacinta Solar Farm refinancing USD 94M (2014) Greenfield	<ul style="list-style-type: none"> <li>Construction loans (provided by DNB and Intesa Sanpaolo) for the development of a 50 MWp solar photovoltaic power plant was refinanced through the issuance of an A/B project bond in a private placement</li> <li>The A/B bond structure entails IDB Invest financing the first tranche of bonds (the A loan), with commercial banks participating in the B loan portion; such a structure was attractive to institutional investors as it allowed B bondholders the same protection and immunity from certain risks which IDB Invest has as a multilateral entity (transferability and currency convertibility)</li> </ul>		
 Brazil	Octávio Frias de Oliveira Bridge USD 113M Greenfield (2004)	<ul style="list-style-type: none"> <li>The Octávio Frias de Oliveira Bridge is a cable stayed bridge over the Pinheiros River that was partially financed with proceeds from Certificates of Potential Additional Construction (CEPAC) bonds</li> <li>CEPAC bonds are sold by municipal governments to developers, allowing developers rights to build above the density limit specified under the zoning regulations while providing upfront capital for the government to build specific infrastructure</li> </ul>		
 India	Greater Bangalore Water Supply and Sewerage Project USD 69.5M Greenfield (2005)	<ul style="list-style-type: none"> <li>Financing of the Greater Bangalore Water Supply and Sewerage Project was raised through 15-year bonds issued by the Karnataka Water and Sanitation Pooled Fund Trust (KWSPFT), the principal of which was 50% guaranteed by USAID</li> <li>The pooled financing mechanism enabled market access for eight local governments which would otherwise be difficult due to factors such as a lack of scale, resources or capabilities</li> </ul>		
 India	Rewa Solar Park PPP USD 1.0B (2018) Greenfield	<ul style="list-style-type: none"> <li>Under the IFC's scaling program, the 750MW Rewa Solar project was split into three units of 250MW each; once the model for single deal was developed, it was replicated across multiple deals</li> <li>A total investment of USD 437M in the form of INR denominated loans was raised through an online reverse auction, which processed the three different transactions simultaneously</li> </ul>		
 Mexico	Monterrey - Nuevo Laredo Highway (La Gloria - San Fernando) USD 192M (2019) Brownfield	<ul style="list-style-type: none"> <li>Acquisition of 20% stake in the highway project by AINDA Energía &amp; Infraestructura (AINDA), a listed private equity fund which raises funds by issuing Development Equity Certificates (CKDs)</li> <li>Development Equity Certificates are trust securities issued by trusts for a specific period of time, which are partially or totally linked to the underlying assets held by the trust, and may include debt as well as capital – Development Equity Certificates may be listed on the Mexican Stock Exchange</li> </ul>		
 USA	Hudson Yards Air Rights Monetization USD 1B (2008) Greenfield	<ul style="list-style-type: none"> <li>The Hudson Yards project is the largest private real estate development in the United States by area; the construction of the deck upon which part of the development will sit was financed by a the sale of USD 1B worth of air rights</li> <li>Transferable development rights (TDRs) or air rights, allow for the transfer of unused development rights to another development site. The transfer of these air rights allows buildings to become taller and bigger than the city zoning code allows</li> </ul>		



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Breaking



# Case-studies were explored across levers and innovation types (IX/X)

★ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 Singapore	Collateralized Loan Obligations (CLO) USD 8.6M (2016) Greenfield	<ul style="list-style-type: none"> <li>★ Clifford Capital sourced 37 loans from 5 institutions and its own book to form the Bayfront Infrastructure project finance CLO (worth USD 458M)</li> <li>This portfolio approach allowed for a diverse project finance loans to make up the underlying collateral pool, freeing up bank balance sheets for the next rounds of projects</li> </ul>		
 India	Sterlite MRP Transmission Assets Acquisition USD 196.4M (2019) Brownfield	<ul style="list-style-type: none"> <li>★ India Grid Trust (IndiGrid), a Sterlite Power sponsored Infrastructure Investment Trust (InvIT), acquired three transmission assets from its sponsor, including RAPP Transmission Co., Purulia and Kharagpur Transmission Co. and Maheshwaram Transmission (collectively known as MRP)</li> <li>Operating assets of developers such as Sterlite Power can be monetized through pooled public capital, recycling cash for fresh projects</li> </ul>		
 USA	DC Water Environmental Impact Bonds USD 25M (2016) Greenfield	<ul style="list-style-type: none"> <li>★ Environmental Impact Bonds were used by the Washington DC water authority (DC Water) to finance green infrastructure such as permeable pavement and green roofs</li> <li>Returns on the bonds are tied to performance of the green infrastructure (environmental impact). Such bonds provide a source of financing while giving investors a greater assurance on the viability of the project</li> </ul>		
 USA	Denver Supportive Housing Initiative USD 8.7M (2016) Greenfield	<ul style="list-style-type: none"> <li>★ The Department of Housing and Urban Development (HUD) and the Department of Justice (DOJ) are piloting a project to tackle chronic homelessness in America under the Pay-for-Success (PFS) financing model</li> <li>The PFS model is similar to a social impact bond, which generates returns for investors in a project only if social goals are achieved</li> </ul>		
 Africa	Room2Run USD 1.0B (2018) Brownfield	<ul style="list-style-type: none"> <li>★ Synthetic securitization of the African Development Bank's (AfDB) USD 1B portfolio comprising of 45 non-sovereign loans spread across 16 African nations</li> <li>The securitization transfers mezzanine risk from the AfDB to investors, creating a risk capital reduction for AfDB and allowing for additional lending headroom of USD 650M to invest in other projects</li> </ul>		
 Canada	Réseau Express Métropolitain (REM) USD 4.8B (2018) Greenfield	<ul style="list-style-type: none"> <li>★ The Réseau Express Métropolitain (REM) is an automated light rail network under construction in Greater Montréal with a total investment of c. USD 4.8B</li> <li>The financing for the project is a unique collaboration between CDPQ (70% equity stake), government of Quebec (30% equity stake) and the Canadian Infrastructure Bank (USD 1B debt finance)</li> </ul>		



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# Case-studies were explored across levers and innovation types (X/X)

★ Deep-Dive  
Available

Country	Use Case	Description/Why is it innovative?	Lever type	Innovation type
 Uganda	Achwa 1 Run-of-River Hydropower USD 0.65M (2019) Greenfield	<ul style="list-style-type: none"> <li>Climate Investor One is a “whole-of-life” financing facility combining innovative investment facilities into one: (1) Development Facility — financing up to 50% of development costs, (2) Construction Facility – financing up to 75% of investment costs on commercial terms and, (3) Refinancing Facility — right of first refusal on up to 50% of the long-term refinanced debt of derisked projects after they enter commercial operation</li> <li>Due to the combination of facilities, projects are built for 7–21% less capital than a typical project</li> </ul>		
 Morocco	Noor Ouarzazate I Concentrated Solar USD 846M (2012) Greenfield	<ul style="list-style-type: none"> <li>A collaborative financing package comprised of public and private sources as well as climate-focused funds</li> <li>At USD 0.18 (equivalent to MAD 1.62), the tariff offered by the winning bidder was the lowest ascribed at the time for Concentrated Solar Power (CSP) technology. This was achieved through a blend of loans from Development Financing Agencies (DFIs) and International Financial Institutions with tenors ranging from 15 to 40 years, as well as necessary institutional and specialised technical support and some non-repayable grants</li> </ul>		
 Nigeria	NEoT Micro-utility investments USD 20M	<ul style="list-style-type: none"> <li>NEoT Offgrid Africa invested in Sabon Gari Energy, a micro-utility project in Nigeria, which will provide electrification of the market under a power-as-a-service model (PaaS), through installation of solar panels on residential homes and SMME premises</li> <li>Under the PaaS model, Sabon Gari Energy will provide power, service infrastructure (installation and service calls), maintenance and financing – consumers do not need to own any expensive solar infrastructure, and are only billed for the amount of wattage that is used</li> </ul>		



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