

Ideas and Solutions to Address the USD 50 Trillion Infrastructure Deficit

A CONTRIBUTION TO THE
2015 G-20 SUMMIT, ANTALYA, TURKEY

International Institute for Sustainable Development

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Ideas and Solutions to Address the USD 50 Trillion Infrastructure Deficit: A Contribution to the 2015 G-20 Summit, Antalya, Turkey

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PREFACE

The opportunity costs of not addressing the global infrastructure deficit are too high.¹ For every USD 1 billion in infrastructure spending, 16,700 jobs are supported annually, and GDP is boosted by USD 1.14 billion resulting in a multiplier effect of 1.143 (Brodhead, Darling, & Mullin, 2014). More than a quarter of productivity growth across 1962 and 2006 across OECD and G-20 countries is a result of public infrastructure investment, and governments have the potential to recover between 30 to 35 per cent of every dollar spent on public infrastructure through higher personal, corporate and indirect taxes (Brodhead, Darling, & Mullin, 2014). The fact is that investment in infrastructure brings tangible economic returns even before projects are completed, as the construction stage alone generates sufficient multipliers to justify the expense.

This report presents a broad brush review of how G-20 countries can begin to address their infrastructure gap and understand why this gap has arisen in the first place, though not all issues are discussed here.

There is a very strong need for project development funds to cover the costs of robust project preparation. As well, there is a strong case for fiscal allowances and performance-based incentives to encourage the wider deployment of sustainable assets. Moreover, there is so much attention paid to the structuring of deals that their longer-term affordability is often overlooked.

IISD looks forward to deepening this debate, further examining the ideas proposed in this report and contributing to the leadership discourse of the G-20 in addressing this challenge.

¹ The OECD report on *Infrastructure to 2030* (volumes 1 and 2) published in 2006/2007 estimated global infrastructure requirements to 2030 to be in the order of USD 50 trillion.

1

MAKE DEBT FINANCE WORK





Given the current abundance of available capital and low long-term interest rates, as low as 100 points (or lower) in developed economies,² the world should be experiencing a boom in infrastructure development. Instead, a mismatch between available investment capital and infrastructural demand for that capital has proven to be a significant stumbling block. International capital markets have the ability to overcome this mismatch, but they remain largely—and sadly—untapped. Fixing this will require financial innovation in infrastructure, starting with expanding the financial instruments available to infrastructure projects to reduce unnecessary costs and make projects more appealing to investors.

Direct equity investment and bank loans currently dominate infrastructure investment: expanding investment in the sector requires the provision of a broader mix of investable financial instruments. Indeed, it is critical, given the complexity of infrastructure deals, that the correct financing instrument be matched with the requirements of each project phase.

MATCHING DEBT INSTRUMENTS AND PROJECT STAGES TO MAXIMIZE BENEFITS

Each stage in a project has unique characteristics, with the initial phases carrying the highest level of risk and lowest level of investment liquidity. It is thus critical that debt instruments with an appropriate profile are chosen according to the features of each stage.

Bank loans typically provide the largest share of financing during the construction phase because of the following key benefits (Ehlers, 2014):

- 1) They allow the gradual disbursement of funds, avoiding any unnecessary negative carry³ due to the loan's interest rates for the project.
- 2) Banks can quickly respond to unexpected events and negotiate any necessary debt restructuring—which is very common at the construction stage due to such things as design changes, construction delays and significant cost increases. The restructuring of bonds, in comparison, is complex and time-consuming.
- 3) Banks typically have specialized in-house project finance departments with the necessary expertise, and can thus lower default risks at this stage by providing due diligence and monitoring, roles that cannot be performed by bond holders.

² The 12-month US dollar (USD) LIBOR interest rate is the average interest rate at which a selection of banks in London are prepared to lend. It serves as a benchmark worldwide. LIBOR has maintained levels below 100 basis points since 2012.

³ Negative carry occurs when the cost of the loan (interest) exceeds the yield earned—at that moment—from the infrastructure investment.



TABLE 1: Suitable Debt Instruments for Particular Infrastructure Project Phases

	INFRASTRUCTURE PROJECT PHASE	
	CONSTRUCTION	OPERATION
Financial Characteristics	The project does not generate positive cash flows at this stage. It is fundamental to structure the debt holder’s (mostly banks at this stage) pay-back period far beyond this stage.	The asset delivers positive cash flows.
General Risk Level	High-risk phase. Unexpected events are likely due to the complexity of infrastructure projects, such as change in design, construction delays and significant cost increases.	The risk of default lessens significantly.
Suitable Debt Instrument ⁴	Loan financing E.g., Bank syndicated loans	Bond financing E.g., Project bonds, social impact bonds, asset-backed securities, green bonds, among others.

Source: Author data.

MAXIMIZING THE POTENTIAL OF BOND FINANCING

Bond financing has the greatest potential during the operation phase, when a project’s risks are much lower and it is generating positive cash flows. Yet infrastructure bonds⁵ remain marginal in global debt markets, where bank syndicated loans⁶ still dominate despite the advantages of a well-structured bond issuance. One critical disadvantage of this bank financing is the risk of an asset–liability mismatch⁷ on their balance sheet: the short-term liabilities accruing to a bank inevitably restricts the maturity of the assets they can safely hold. They are also subject to stricter government regulations regarding stress testing and liquidity ratios.

Seen in this light, the advantages of bond financing are clear. For example, i) their funding cost is much lower than bank loans; ii) their unique cash flow resembles that of fixed-income securities; iii) bonds make infrastructure investments tradeable; iv) innovative instruments such as green bonds, social impact bonds and infrastructure bonds could trigger long-term institutional investment into infrastructure assets and give rise to a new asset class. Given these advantages, bond financing is clearly the more economically appropriate instrument for infrastructure financing at the operation phase.

⁴ Please note: all infrastructure projects finances are constructed in a hybrid manner with tranches of equity and debt. This section and the table above concentrate on the debt instruments only.

⁵ Infrastructure bonds are a subsector of project bonds by issuers from infrastructure related industries.

⁶ Bank syndicated loans are loans provided by a group of banks to a single borrower. Typically these are used when the loan amount is too high to be provided by a single borrower—by doing so the risk can be spread accordingly.

⁷ The operation phase is significantly longer than the construction period, which increases the risk of asset–liability mismatch.

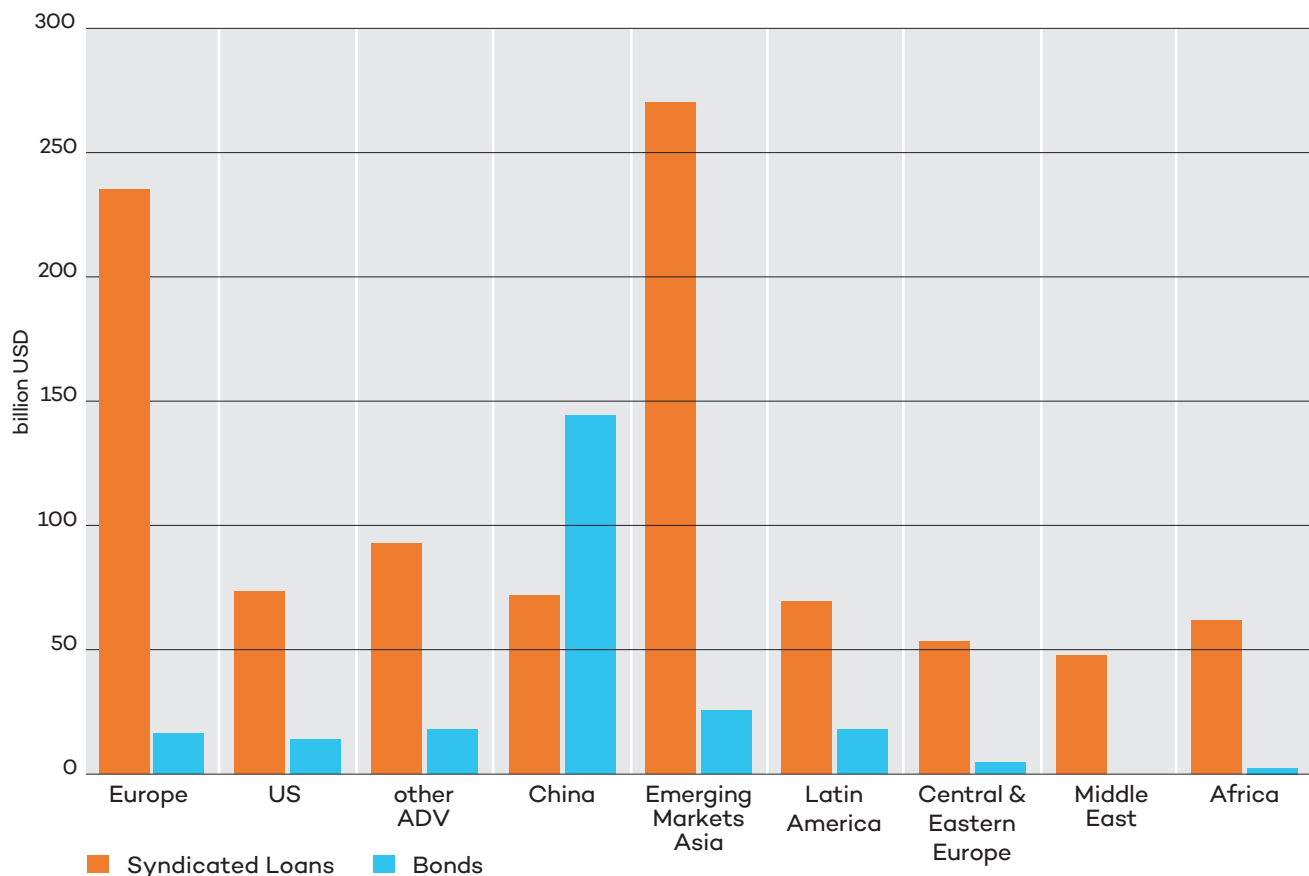


FIGURE 1: Infrastructure Bonds Versus Syndicate Loans 2009–2013

Source: Ehlers, Packer, & Remolona (2014)

HOW CAN G-20 MEMBER COUNTRIES PROMOTE SUSTAINABLE INFRASTRUCTURE BOND FINANCING TO MAXIMIZE BENEFITS?

Financial deepening in emerging markets: A resilient local debt market is a prerequisite for infrastructure bond issuances, because potential currency mismatches can add significant costs to offshore issuances. G-20 members need to develop strong policies, legal frameworks, transparency and bureaucratic efficiencies in order to encourage the emergence of a sustainable infrastructure bonds market.

Innovative public initiatives: Institutional investors usually require additional credit guarantees to reduce default risk to an acceptable level in line with their fiduciary duty, and without guarantees, it is difficult to gain their participation. Credit enhancement is thus critical for infrastructure-related bonds market development.

The best practice example of innovative public initiatives is the Project Bond Initiative launched by the European Commission and the European Investment Bank (Monetary and Economic Department, n.d.). This project attracts institutional investors by providing stable and predictable cash flow generation potential. It does this by enhancing the



credit quality of project bonds issued by private companies, and last year successfully triggered larger institutional investment for eight infrastructure projects across Europe.

The role of development banks and export-import credit agencies:

Development banks and export-import credit agencies can play a key role in guaranteeing infrastructure investments in less-developed financial markets. For example, in Bangladesh the Infrastructure Development Company Limited and Renewable Energy (IDCOL)—a state-owned non-bank financial institution—has played a major role in developing and financing medium- and large-scale

infrastructure, renewable energy and energy-efficient projects in that country (Halle & Silva, 2015). The company now stands as the country's market leader in private sector energy and infrastructure financing. Bangladesh has not issued any infrastructure bonds at present, but the creation of IDCOL has allowed a least-developed country like Bangladesh to move in that direction.

The G-20 governments are concessionaires of the vast majority of infrastructure projects. They must thus conduct themselves as dealmakers to ensure the right deal structuring and the efficient sharing of risk, and thereby ensure a bankable pipeline of infrastructure projects to be financed.

2

MITIGATE CONSTRUCTION RISK





The term “construction risk” (also referred to as project completion risk) covers a wide range of risks associated with the development of (mainly) greenfield infrastructure projects. It includes cost overruns, construction delays and uncertainties with the new technologies used, as well as other risks associated with the construction company.

For a large number of investors, construction risk is a major barrier to adding infrastructure to their portfolios. They often lack the expertise to make the additional risk assessment needed (which can differ significantly depending on the type of the asset and the specific characteristics of the sector) and/or simply lack the risk appetite to deal with the wide range of uncertainties that can potentially have a substantial impact on the bankability of the entire project. Charles Halam-Andres, managing director

of Scotia Capital, highlighted that some solar and biomass projects in Canada were unable to use bond financing due to the market’s discomfort with their construction risk (McLaughlin, 2011). In addition, the construction phase has other notable challenges, such as the lack of cash flow generated and the inability to use the asset as collateral (as it is currently being developed). This is especially important for projects with non-recourse/limited recourse financing, as often the only source of revenue to cover the debt comes from the project’s cash flows.

However, it is important to highlight that the higher risks of early investor participation are also accompanied by higher returns. McKinsey estimates that investors can realize an equity risk premium of around 800 basis points by committing capital already in the construction phase, as illustrated by Figure 2.

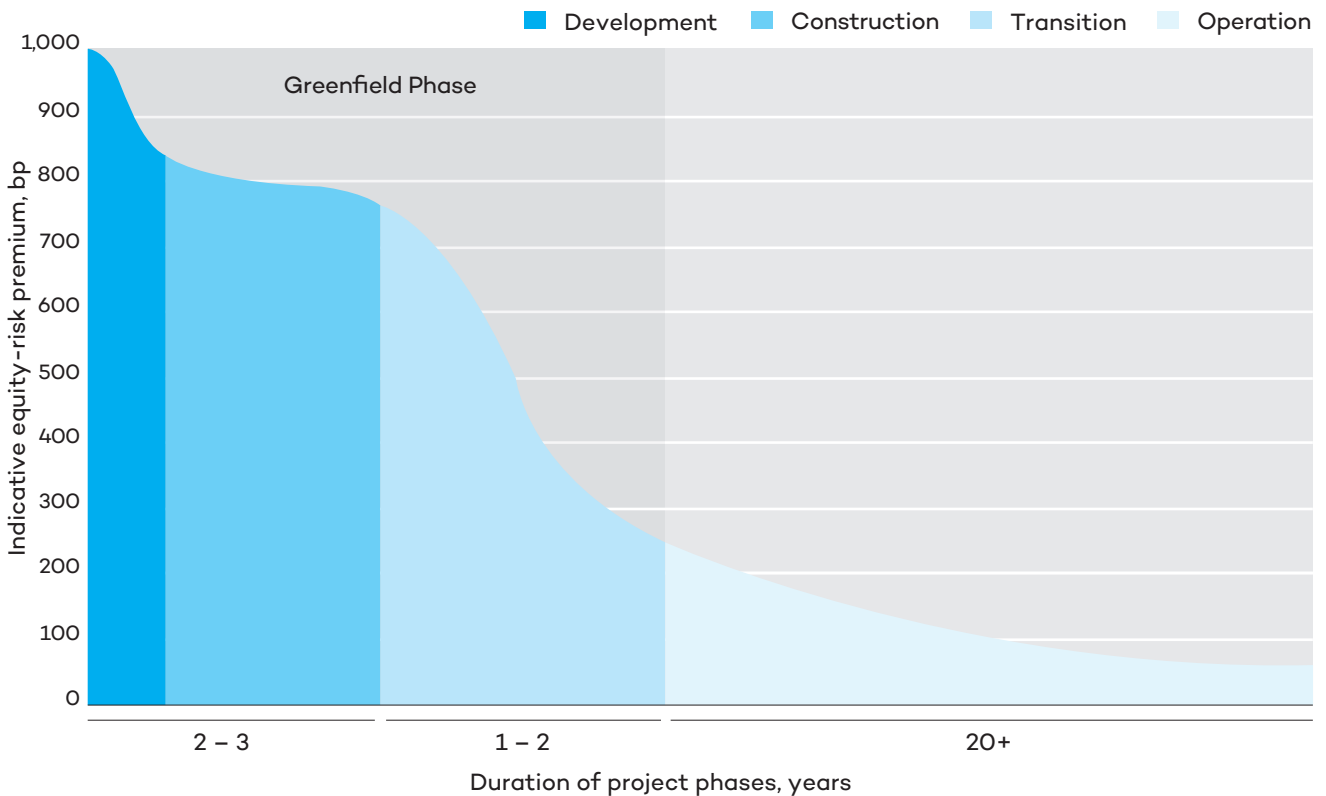


FIGURE 2: Indicative Risk Premium and Timeline, by Project Phase

Source: Déau & Touati (2015)



For attracting early equity or debt capital, there are a wide range of financial solutions available to mitigate and, in some cases, even eliminate construction risk. Their effectiveness, however, may vary depending on the scale and other unique characteristics of the project.

At the project level, *contractual agreements* are widely used as risk-mitigation instruments. With the right agreements in place, project sponsors can significantly limit the risks during the construction phase by transferring some or all of these risks to the construction contractor. One prominent example is the *turnkey construction contract*, also called the *EPC (engineering, procurement and construction) contract*, where the contractor commits to completing the project by a predetermined date and cost meeting all the agreed specifications of the asset. If the contractor is not able to fulfill its obligations, the contract defines the liquidated damages and penalties that need to be paid. While it can potentially eliminate construction risk, the feasibility of turnkey contracts largely depends on the creditworthiness of the contractor and the size of the underlying project. A low credit rating may imply a high counterparty risk and can result in investors demanding additional measures to ensure that the contractor is able to meet its contractual obligations.

For large-scale projects or for projects with more complex, untested technologies, contractors sometimes will not agree to a turnkey construction contract, or the lenders might require additional assurances to cover the possibility of the contractor unable to meet its contractual obligations. As discussed earlier, in some cases investors are not willing to take on this risk, thereby potentially blocking otherwise financially viable infrastructure projects.

This underlines the need for external risk mitigation instruments in the form of credit-enhancement mechanisms. Government (or multilateral agency) support for construction risk-mitigation measures is particularly important, and justified, as construction delays can also have a wider economic impact. For example, McKinsey estimates that delays to the opening of Hong Kong airport resulted in a loss of more than USD 600 million to the economy (Beckers et al., 2013). Especially for sustainable infrastructure projects, with a wide range of economic, environmental, social and economic multipliers, construction delays or project failures due to the lack of cheap financing will be at the end a cost that the society and the economy need to bear.

CONSTRUCTION RISK GUARANTEES

Government agencies, multilateral development banks (MDGs) or project development funds could assume part or all of the construction risk in the form of guarantees. By addressing this important barrier to financing, governments can better leverage their limited financial resources and more efficiently mobilize private sector investment in infrastructure development. The guarantees need to specify the range of construction-related risks covered, and the methodology used to calculate the appropriate level of compensation provided by the guarantor. Their structure and scope can vary depending on requirements of the project and the specific mandate of the guaranteeing entity. Guarantees would not be a substitute for a well-structured construction contract, but instead they would complement them, providing an additional level of certainty for investors and therefore decreasing the cost of financing.



Recent examples include the India Infrastructure Finance Company's (IIFCL) initiative with the Asian Development Bank (ADB) to provide project-completion risk guarantees for infrastructure projects. "It's a new product we are looking at. Already, talks are on with the Asian Development Bank. It is at the development stage," said IIFCL Chairman & Managing Director S.B. Nayar (qtd. in Srivats, 2015). Also, the Inter-American Development Bank (IDB) has recently begun to focus on ameliorating specific concerns such as construction risk in approved projects to attract private financing (Aravamuthan, Ruete, & Dominguez, 2015). Similarly, the UK Guarantee Scheme was set up in 2012 to stimulate lending to infrastructure projects, also offering services for transferring construction risk to the government for a fee (Plimmer, 2015).

FIRST-LOSS PROTECTION

First-loss protection (FLP) solutions are designed to mitigate the financial loss of investors by providing a subordinated layer of capital. FLP instruments can either take the form of a direct investment into the project (subordinated debt tranche) or a contingency credit line, which is only drawn upon if needed. By using FLP in the construction phase, the underlying construction risks can be significantly mitigated (depending on the size of the FLP). The main difference between FLP and the guarantees discussed earlier is that FLP only partially covers these risks, while guarantees can potentially eliminate all construction-related risks of the project. The funding for FLP instruments can come from government agencies, MDGs or project development funds.

As a current example, the Europe 2020 Project Bond Initiative (PBI), a joint initiative by the European Investment Bank (EIB) and the European Commission, stimulates capital market financing for large-scale infrastructure projects using the FLP solutions discussed earlier. PBI provides partial credit enhancement by separating the bond issue into a senior and a subordinated tranche. The EIB will guarantee the subordinated tranche, which can be in the form of a loan or contingent credit line (European Investment Bank, n.d.).

VIABILITY GAP FUNDING

For pro-poor or other socially and economically essential infrastructure, viability gap funding (VGF) might be justified to overcome the lack of financing in the construction phase. VGF is a grant-based funding provided by government entities, multilateral development agencies or infrastructure funds. By reducing upfront costs, VGF makes projects that are economically viable over the long term commercially viable for investors.

For example, the Private Infrastructure Development Group's (PIDG's) Technical Assistance Facility (TAF) provides VGF for pro-poor infrastructure projects. In order to mitigate the risks associated with this unique type of funding, it follows stringent procedures and safeguards. TAF only commits funding after a sufficient amount of equity investment has been secured, confirming investor commitment to the success of the project. The VGF is also limited to ensuring that the underlying project risks are not completely eliminated for investors. In addition, an independent expert panel has been set up to evaluate potential projects eligible for VGF. In



2003, grants were approved totalling USD 12.1 million, which include a solid-waste management project in Kampala, Uganda, a run-of-river hydro-electricity project in Vietnam and a series of renewable energy projects in Cambodia, Lao PDR and Myanmar (PIDG, 2014).

Another example is the Green Municipal Fund (GMF) based in Canada. It provides funding and knowledge services to support sustainable community development. GMF finances projects at the municipal level that improve air, water and soil, and mitigate the impacts of climate change. For greenfield projects, it provides concessional loans, usually in combination with grants, up to a maximum loan amount of CAD 5 million, and the maximum grant amount is set at 15 per cent of the loan. For brownfield projects, only concessional loans are available, without an upper limit. (GMF, 2015).

All of the credit enhancement solutions proposed above have certain fees and transaction costs associated with them. Project sponsors need to carefully evaluate whether these costs justify the expected benefits, such as lower cost of financing. Governments also need to assess whether credit enhancement instruments are indeed the best way to use their balance sheet and realize essential infrastructure projects for their economies. Anecdotal evidence suggests that, while there have been some important initiatives in this area, their usage and popularity remains limited. More fine-tuning might be needed to better address the needs of procurers as well as those of investors before these instruments can become more mainstream.

3

ACCESS CAPITAL FROM ISLAMIC FINANCIERS





Authored by Fida Rana, Lead Investment Specialist, Public Private Partnerships, Project & Infrastructure Finance, Islamic Development Bank, and Elham Hassanzadeh, Managing Director, Energy Pioneers Ltd

THE INTERCONNECTION BETWEEN ISLAMIC FINANCE AND SUSTAINABLE DEVELOPMENT⁸

The global 2008 financial crisis and the hardships it imposed across the world raised many questions about the stability and sustainability of the conventional financial system. Calls still continue for alternative systems that could serve the long-term interests of average citizens. Many observers believe that the Islamic financial system can provide such an alternative, making

significant contributions to the sustainable development of global financial markets.

The principles of Islamic finance have strong ties to financial stability and corporate social responsibility within the global business context. They offer mutuality, sustainability, interest in the business of all parties concerned and interest in the success of the end result. Islamic finance principles serve to insulate the Islamic financial system from excessive leverage, speculation and uncertainty, which in turn contributes toward promoting financial stability and long-term sustainability. As a result, the implementation of Islamic finance principles is anticipated to grow, not only in Muslim countries' financial markets, but also in those markets concerned with socially responsible objectives and ethical financial solutions.

ISLAMIC FINANCE PRINCIPLES

Riba (usury/interest)

One key tenet of Islamic finance in economic activities is the strict and explicit prohibition of *riba*, usually described as usury or interest. According to Sharia principles, contracts where one party has unjust enrichment at the expense of another party's loss are considered void. Indeed receiving a monetary advantage without giving a counter value is forbidden on ethical grounds. Depending on the interpretation, *riba* may only refer to excessive interest; however, to many scholars, the whole concept of interest is *riba*, and thus is unlawful.

Gharar (uncertainty)

Gharar in literal terms means to deceive, cheat, delude, lure, entice and any act that causes uncertainty. In Islamic finance, *gharar* refers to contractual uncertainty characterized by ambiguity that may lead to dispute between the contracting parties. An example might be the execution of a contract before the price, subject matter or the transacting parties are definitively known (Ethica, 2013). Under Sharia law any uncertainty (*gharar*) as to one of the fundamental terms of a contract is prohibited, and such uncertainty renders the contract void and null.

⁸ Portions of this section have appeared previously in Myers, T.A., & Hassanzadeh, E. (2013). *Interconnections between Islamic Finance and Sustainable Finance*. Winnipeg: International Institute for Sustainable Development. Retrieved from <https://www.iisd.org/publications/interconnections-between-islamic-finance-and-sustainable-finance>



Maisir (speculation)

Maisir, or speculation, is generally defined in Islamic finance as the act of gambling where an easy profit is gained by chance rather than productive activity. It is regarded as morally unacceptable, because it results from the desire to win at the expense of others, and potentially leads to hostile behaviour. In Islamic finance, for example, the transaction must be genuine with the full intention of giving and taking delivery; the debt cannot be sold, and thus the risk associated with it cannot be transferred to someone else.

Asset-Backed Financing

One of the most significant characteristics of Islamic financing is that it is asset-backed (Usmani, 1998). In conventional markets, banks and financial institutions deal with money and money papers only, whereas in Islamic financing, money is only a means of exchange and has no intrinsic utility (Usmani, 1998). Since interest-based transactions are prohibited in Islam, businesses are encouraged to generate fair and legitimate profits from productive commercial activities. Most financial instruments in Islamic finance, such as *Murabahah*, *Ijarah*, *Salam* and *Istisna'a*, which are alternatives to debt-based instruments in conventional finance, require the existence of real assets in order to ensure their legitimacy for Islamic finance. In conventional financial instruments, risk is generally separated from the underlying assets; as a result, risk management and wealth creation may at times move in different—even opposite—directions. These instruments also allow for the commoditization of risk, leading to excessive leveraging and disproportionate distribution that can result in higher systemic risks and increase the potential for instability and inequitable concentration of wealth (Mirakhor & Zaidi, 2007).

Profit-Loss Sharing Principle

Unlike conventional banks, which put emphasis on receiving interest payments irrespective of the project's high or low level of profitability, Islamic banks rigorously follow the business activities of the debtor and the return on the physical investment as “[their] own profitability is directly linked to the real rate of return” (Mirakhor & Zaidi, 2007). In conventional markets, the financier and entrepreneur are two separate elements of production. While the former gets interest based on a fixed rate of return for providing capital, the latter is entitled to profit only if there is a surplus after distributing the fixed return to land, labour and capital. According to Mufti Taqi Usmani (1998), one of the leading Sharia scholars, in Islam every person who contributes capital to a commercial enterprise assumes the risk of loss, and hence is entitled to a proportionate share in the actual profit. In other words, instead of fixed return as interest, the financier is entitled to share the profit with the entrepreneur. As a result, profit-and-loss sharing contracts promote greater stability in financial markets, encouraging banks to focus on the long run in their relationships with their clients.



PRIVATE-PUBLIC PARTNERSHIP (PPP)

Conventional project finance structures have evolved to take into account project risks by apportioning the risks to the participants according to their role and who is best able to assume the risks. When we introduce Islamic finance into the traditional project finance paradigm, two possible options arise: a single tranche transaction comprising only Shariah-compliant funding with no conventional *riba*-based financing; and a multi-tranche transaction where conventional and Shariah-compliant tranches of funding are integrated in a single financing. The former type of transaction is not common, especially in large project finances, since the liquidity of Islamic banks and the capitalization requirements of such banks mean that they cannot alone finance such project.

How Does the Structure Work?

While these projects are becoming a meeting place of conventional and Islamic tranches, one frequently asked question is how these two financing classes are integrated in a single project. It is indeed essential that the issues and tensions that may surface when integrating these two tranches in a single project financing are resolved at the outset.

During the normal course of a project's operation, conventional and Islamic banks are paid from the project's cash waterfall on a *pari passu*⁹ basis—be it scheduled payments or mandatory/voluntary prepayments. Prepayments are usually applied pro rata to both senior conventional and Islamic lenders in the pre-enforcement payment waterfall, and the protocol is well defined in the inter-creditor agreement.

The test of co-existence comes when the project goes bad. That is why practitioners put a great deal of effort into ensuring that the exercise of remedies in a default scenario between the conventional and Islamic tranches is harmonized. This is because the project is an indivisible whole and, as an inter-creditor matter, it would not be acceptable for one tranche to be accelerated/repaid as a result of an event of default, while others are unable to do so.

This challenge is addressed through a concept known as “common security pool.” The Islamic banks undertake to put their ownership right of an asset in favour of common security pool when it comes to a default scenario. The melting pot of common security pool is shared *pari passu* among all lenders—conventional and Islamic alike.

Let's take the simple case of a power plant financing, where both conventional and Islamic banks are present. If the Islamic bank is offering lease financing, which is the predominant mode of financing by Islamic banks in this type of project, the bank will be owner of that particular asset, e.g., the turbine or generator. Does this mean in a default scenario the *pari passu* nature of lenders are compromised? (As all the secured assets are supposed to share pro-rata among the senior lenders, but by virtue of ownership, is there the risk that the Islamic bank can block its owned assets to be liquidated and shared with others? In fact, the *pari passu* nature is not compromised, as long as the common security pool concept remains intact. The Islamic lender provides an undertaking that, in a default case, the generator or turbine that the bank owns, will become part of the common security pool, hence will be liquidated and shared by all lenders.

⁹ A Latin phrase meaning “equal footing” that describes situations where two or more assets, securities, creditors or obligations are equally managed without any display of preference.



What are the Modes of Finance?

The two predominant modes of financing PPP projects are *Ijara* (lease purchase finance) and *Istisna'a* (commissioned manufacture of specified asset).

The *Ijarah* is a form of lease financing under which the usufruct of an asset or the services is leased by the lessor (Islamic lender) to the lessee (SPV) for rental consideration. Under the *Ijarah*, the lessor will purchase the asset from the supplier and then transfer possession to the lessee, with the profit margin built into each lease payment over the term of the lease. In practice, the SPV acts as an agent on behalf of the Islamic lender, allowing them full authority to draw down the fund, in pro rata with other lenders, to procure the project assets. Once the construction is over, the SPV puts on the hat of the lessee, and start paying rental payment to the Islamic lender, as well as service interests to conventional lenders.

An *Istisna'a* is a construction and procurement contract for the commissioned manufacture of a specified asset and can be used during the construction phase of a project financing. Following a request from the client, the financier procures the contractor to manufacture an asset that meets the specifications of the client for delivery by a specified date. The financier will, in practice, appoint the client as its agent to enter into EPC contract with the contractor. Shariah requires that the price payable for an asset is fixed at the outset and only altered if the specification of the asset is amended by the client. Once the asset has been constructed, title to the asset must be transferred by the contractor to the financier, who will then either sell the asset to the client outright or alternatively lease the asset to the client pursuant to an *Ijarah*.

New Instruments in the Making

There are a number of initiatives among the Islamic financing agencies on developing new instruments to channel more resources to PPP projects through Islamic finance mechanisms. Two instruments that are actively under consideration are Project *Sukuk* and *Mudaraba* investment.

Although *Sukuk* are often referred to as Islamic bonds, they are more akin to Islamic trust certificates representing an undivided beneficial ownership interest in an underlying asset where the return is based on the performance of the underlying asset. The key attributes of *Sukuk* are that they are asset-based securities and any profit or benefit derived from the *Sukuk* must be linked to the performance of a real asset and the risks associated with ownership of that asset. The challenges of developing project *Sukuk* are related to funding the construction phase of a PPP project, when the asset is being developed and yet to reach the income-generating stage. Furthermore, as opposed to *Istisna'a* financing, where the fund can be drawn up in stages, *Sukuk* is generally structured in a way where the full amount would be drawn in one go—hence there is also the issue of negative carry.

On the other hand, the *Mudaraba* structure has been in use for some time, and Islamic financing institutions, especially the Islamic Development Bank, have deployed this instrument successfully in a number of PPP projects. Under the *Mudaraba* structure, the fronting bank acts as an investment manager, pooling resources from bilateral institutions for investing into PPP projects. A variant of *Mudaraba* structure, known as the B-loan, is being discussed among Islamic finance practitioners, where the investee organizations will enjoy more visibility in PPP transactions.

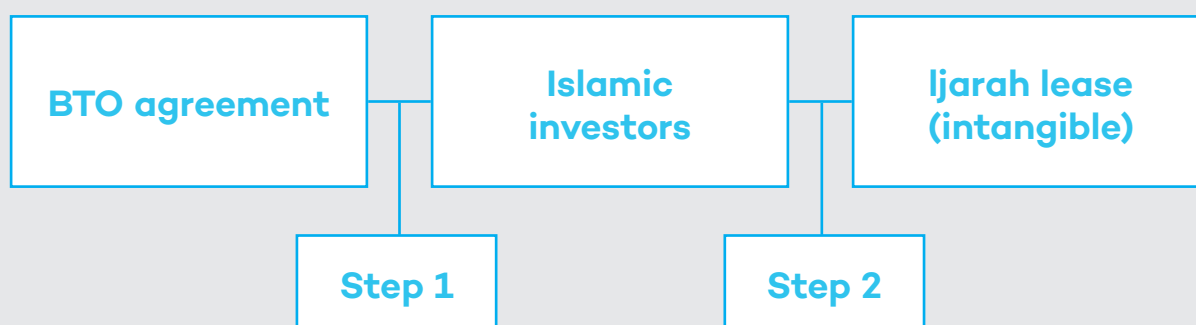


THE HAJJ TERMINAL EXPANSION, KING ABDULAZIZ INTERNATIONAL AIRPORT. JEDDAH, SAUDI ARABIA

The Hajj terminal expansion (a separate terminal at the King Abdulaziz International Airport in Jeddah, Saudi Arabia dedicated to pilgrims and visitors of the holy city of Mecca) was financed with approximately USD 205 million of Shariah-compliant debt.

The sponsor, the Saudi Binladin Group, was awarded a concession (the right to operate the terminal) with the new and refurbished assets required to be constructed being transferred to the General Authority of Civil Aviation (GACA) after completion of construction works. Therefore the new terminal assets constructed by the concessionaire could not form part of an *Ijarah* structure.

To overcome this issue, the financing was structured under an *Ijarah* structure where rights under the concession agreement (the Build-Transfer-Operate [BTO] Agreement granting the right to run the terminal) were sold to the Islamic financiers and then leased back to the sponsor in exchange for traditional rental payments. This structure is well suited to further infrastructure PPP projects.



Step 1: BTO Agreement between GACA and concessionaire. Rights under the agreement are sold to a third party. Islamic investors purchase BTO agreement rights from a third party.

Step 2: Islamic Investors enter into a forward lease agreement of the rights under the BTO with the Hajj Terminal Development Company.

FIGURE 3: Hajj Terminal Structure

Source: Al-Sudairi & Nethercott (2014)



How Islamic Financing Arrangements for PP Can Deliver More Efficient and Reliable Assets

Given the principles of *riba* (usury/interest) and the asset-backed nature of Islamic finance, investors are encouraged to take a much larger interest in the success of their investment than in mainstream PPP financing. In addition, the principles of *gharar* (uncertainty) and *maisir* (speculation) also discourage excessive risk taking and require that investment decisions are made on the longer-term success of the asset. These fundamentals are well suited to PPP arrangements, for both the pre-construction and post-construction stages of financing. In addition, arrangements such as the common security pool as well as financing

modes—*Ijara* (lease purchase finance) *istisna'a* (commissioned manufacture of a specified asset)—provide secure means of blending Islamic finance with mainstream instruments.

The possibility of blending Islamic financing with mainstream finance presents increased opportunities for all countries to access capital for Islamic investors. Indeed, opportunities to work with Islamic financiers need not and should not be limited to Islamic nations: all projects seek investors that are likely to practice “patient finance” and invest with longer-term perspectives. Closing the global infrastructure deficit will certainly require the help of Islamic financiers.

4

OVERCOME THE
BARRIERS OF SCALE





Infrastructure as an alternative asset class has been on the radar of institutional investors globally. However, IISD's consultations with investors have highlighted the need for better structured projects having a sufficient, investable size. While solutions to improve project preparation might be more evident (such as devoting enough resources, following guidelines, using the necessary tools), overcoming the challenges posed by the lack of scale could be more difficult. This explains why significantly more financing has been directed to large infrastructure projects, while essential small-scale projects are struggling to generate investor interest.

The need for small-scale infrastructure has been rising due to the current trend of decentralization of infrastructure services such as water services and electricity. Especially in emerging and developing countries, where the proportion of small projects is said to be higher, essential infrastructure projects with high economic and social multipliers—the International Monetary Fund (IMF) estimates a fiscal multiplier of USD 1.6 for every dollar spent (Campanella, 2015)—have difficulties raising financing. Even multilateral development banks (MDBs) tend to focus on providing financing to large-scale projects (i.e., above USD 30 million), as per the UN's Department of Economic and Social Affairs (DESA) (Bond, Platz, & Magnusson, 2012).

Small-scale infrastructure is a critical component of stable economic development. Its importance is not only explained by the essential services and businesses it enables locally, but without investment in small-scale infrastructure, the economic and social benefits of large projects would also be

limited. For example, if a port is not easily reachable due to the lack of a sufficient road system, the increased time and cost of transportation might make trade and shipping economically unfeasible.

Project aggregation, where smaller infrastructure projects are bundled together, is one solution for overcoming investor concerns with scale. The limited number of initiatives in this area may be due to the high transaction costs associated with preparation, due diligence and structuring of small projects and, indeed, a number of other regulatory, political and physical challenges.

In terms of physical planning, aggregation of infrastructure projects can be done by either: a) bundling multiple projects, both existing and planned, or b) focusing on a single greenfield investment that will serve multiple jurisdictions within a given location. The former example can be implemented as a fund structure, with a specific sector focus (e.g., private equity funds), city focus (e.g., Tamil Nadu Urban Development Fund) or as a corporate structure (e.g., IL&FS Transportation Networks Limited).

Existing solutions include the West Coast Infrastructure Exchange (WCX) pilot of drinking and wastewater infrastructure project aggregation (West Coast Infrastructure Exchange, 2015). WCX was established in 2012 by a framework agreement between the states of California, Oregon, Washington and the province of British Columbia in order to identify opportunities and scale up infrastructure projects with a significant social impact (Hachigian, 2014). WCX argues that many of the underlying challenges with the region's water infrastructure can be addressed by using public-private partnerships (PPPs).



While keeping ownership of the assets, the public sector could transfer the responsibilities of design, build, finance and maintain (DBFM) of water infrastructure to the private sector, realizing significant efficiency gains. Through deal aggregation, the WCX aims to achieve the necessary scale required for the DBFM approach. There needs to be a single counterparty created (a special purpose vehicle), which will have the legal authority to negotiate and contract on behalf of all participating jurisdictions. WCX identified the following screening criteria for deal aggregation in the local context: 1. political backing, 2. support from stakeholders and 3. projects in jurisdictions with similar challenges. The operating profile of the projects should be similar in terms of, among other considerations, 1. proximity, 2. scale, 3. user fees charged and 4. household income and population trends in their regions.

Another prominent example for a fund structure is the Tamil Nadu Urban Development Fund (TNUDF) of the Tamil Nadu Urban Infrastructure Financial Services Limited (TNUIFSL). The fund's objectives are to provide financing for urban infrastructure projects (which improve the living standards of the urban population), to facilitate private sector participation in infrastructure through joint venture and PPPs, and to improve the financial management of urban local bodies, enabling them to access debt finance from markets (Tamil Nadu Urban Development Fund, n.d.). While its objectives do not specifically include deal aggregation, it finances and bundles smaller-scale projects through its various investments in urban infrastructure, resulting in a similar outcome.

An example of a corporate structure is the IL&FS Transportation Networks Limited (ITNL) in India. Established in 2000 as a subsidiary of IL&FS, it has become the largest build-operate-transfer (BOT) road asset owner in India with approximately 13,100 lane kilometres in its portfolio (including 22 road projects). ITNL acts as developer, operator and facilitator of surface transportation infrastructure projects, taking projects from conceptualization through commissioning to operations and maintenance (IL&FS Transportation Networks Limited, 2013).

Deal aggregation solutions used should go beyond financing, and instead become a project development facility providing assistance to the underlying projects also in other areas, including organizational structure, capacity building, advocacy, project structuring, public development and transaction management. While the scope of some structures covers these areas (e.g., the Tamil Nadu Urban Development Fund), for others, providing this level of service currently falls outside their mandate and objectives.

5

DEVELOP LONG-TERM INFRASTRUCTURE MASTER PLANS





The age of planning is here. From annual development plans to five-year plans and from green economy plans to annual climate change adaptation plans, governments are busy with a plethora of national planning processes all aimed at giving rise to goods, services and infrastructure that will trigger sustainable and inclusive growth.

While all these plans have purpose, they do little to help governments address their infrastructure deficits. In many countries, these plans contain wish lists of projects that have not been vetted on whether or not they are fit-for-purpose, bankable or affordable in the longer term.

The national infrastructure plans of the United Kingdom, the Netherlands and Finland, for example, are driven by long-term vision and commitment toward industrial development, innovation, education and climate resilience. In fact, in the Netherlands, the use of infrastructure plans dates back to the 1960s, especially in relation to water infrastructure, land reclamation and ports. Best practice in infrastructure plans is typically based on 10- to 30-year demand forecasts and broader macroeconomic modelling over a further 20 to 40 years. The project pipelines, which detail the size and status of infrastructure projects, as well as provide breakdowns per sector and region, are a key feature of these plans.

Infrastructure plans are also critical to addressing the mismatch between fiscal revenues and infrastructure financing responsibilities. There have been massive structural changes in the ownership of public infrastructure. In most G-20 countries 50 years ago, federal governments owned and financed approximately 50 per cent of public infrastructure, while municipal governments owned and financed 15 per cent to 20 per cent. Today, the situation could not be more different—municipal governments own and operate over 80 per cent of public infrastructure. The challenge with this structural change is that the distribution of fiscal revenues has taken place in tandem. Federal and provincial governments levy and receive 90 per cent of taxes including sales, income and corporate taxes—revenue streams that correlate to economic growth. Local governments are increasingly dependent on property taxes, a more regressive revenue stream that mostly impacts lower- and middle-income taxpayers. Municipal government therefore face increasing responsibility to finance infrastructure, but badly lack the fiscal capacity to do so. Developing annual infrastructure plans would go a long way to addressing this mismatch and provide for the transferring fiscal capacity from federal to local governments.

Canada constitutes a good example of the fiscal revenue and infrastructure ownership mismatch. In 1955, the federal government owned 44 per cent of public infrastructure, the provinces owned 34 per cent and local governments owned 22 per cent. In 2012, provincial, territorial and municipal governments own and maintained roughly 95 per cent. However, federal and provincial government collect more than 90 per cent of all taxes including sales, income and corporate taxes.

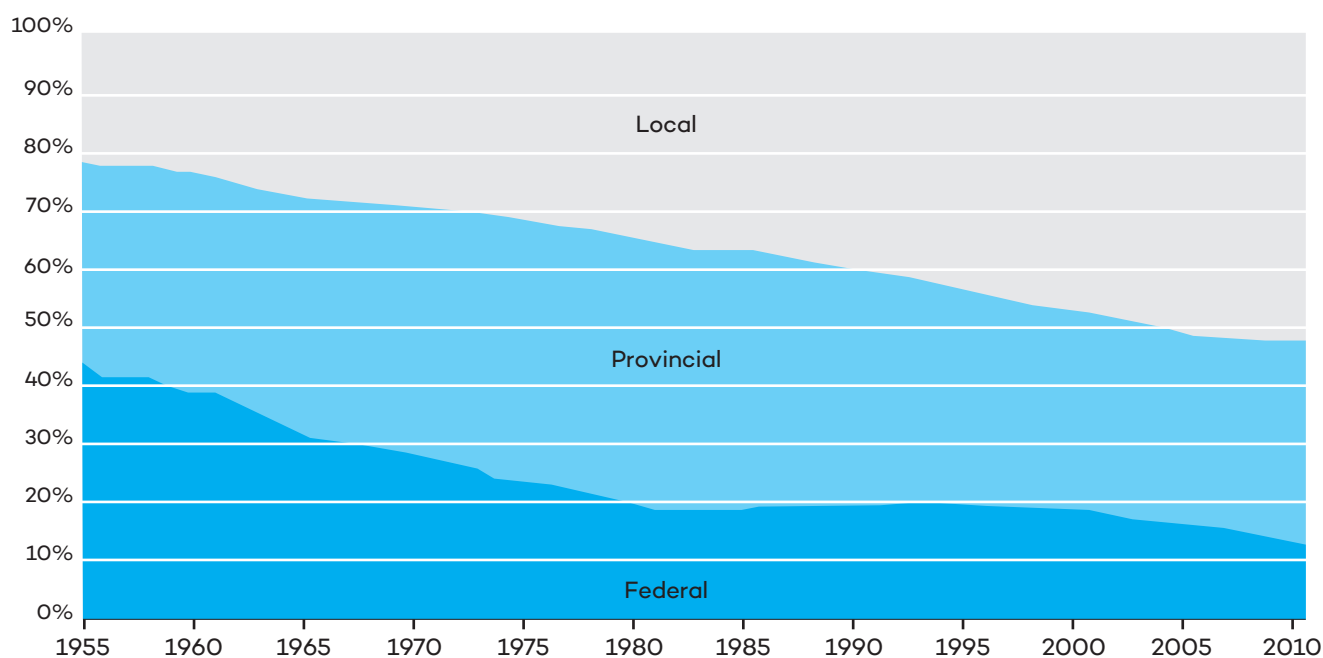


FIGURE 4: Asset Share, by Level of Government in Canada

Canadian Centre for Policy Alternatives, 2013

Infrastructure plans can also help de-link infrastructure investment decisions from annual operating budgets. Infrastructure bottlenecks arise in the first place when spending is tied to annual budgets, which are fraught by short-term outlooks related to deficit reduction. Although infrastructure budgets must not be designed in isolation of the government’s fiscal situation, it is wise that they be partially insulated from the volatility of annual fiscal budgeting.

Given that infrastructure planning operates across time horizons well beyond annual budget cycles, accounting rules and budget planning should be reformed to reflect the multi-year nature of infrastructure investment. There is also much value in accounting separately for capital spending within the government’s fiscal budgeting process. Annual infrastructure plans would be the first step in bringing about these important reforms.

Annual infrastructure plans could provide the impetus for the establishment of knowledge centres in financing, project planning and infrastructure budgeting to provide services to smaller municipalities and public entities. This would help them benefit from the economies of scale associated with larger infrastructure investments.

Modern public infrastructure is the baseline for national prosperity and equitable social progress. Current market conditions, including historically low long-term interest rates, create a window of opportunity for decisive action. National infrastructure deficits should thus be viewed as a window of opportunity to prioritize spending on infrastructure and positing this spending as a trigger for sustainable growth going forward.

6

REFORM PUBLIC PROCUREMENT POLICIES





“To close the global infrastructure deficit, investment needs to be deployed through transparent and accountable public procurement processes.”

Christine Lagarde, Managing Director,
International Monetary Fund, at the
G-20 B-20 meetings, August 2015

Procurement is the part of the infrastructure cycle that receives the least attention. While it might not be as stimulating as bankability analyses and deal structure, the truth is that even the best prepared and structured project will fail if the procurement process is not sufficiently transparent and robust.

Poor procurement policies and mindsets can undermine the delivery of sustainable infrastructure in many ways:

- Procurers often misinterpret value-for-money to mean the cheapest bid rather than the cheapest option to design, construction, manage and operate. The nexus between value-for-money and the total cost of ownership is rarely appreciated. Tenders are therefore awarded to the cheapest bid at the point of commissioning, rather than the cheapest option across the asset life cycle.
- Requests for proposals and specifications are not sufficiently grounded on the outputs of the project preparation phase. As a result, the tender can over-restrict the ways in which the project can be designed to optimize efficiency and drive industrial innovation.
- Over-restrictive, input-based specifications impede efficiency and innovation, as suppliers are locked into delivering solutions based on existing technologies rather than being free to tap into their innovation pipelines.

Addressing these challenges can be difficult, especially given the fact that public procurers are rarely valued as custodians of large budgets. More often than not, public procurement is considered an administrative function, rather than a process that can impact global value chains.

The first change needed is therefore one of mindset—from awarding a tender to the cheapest bidder to one that seeks value for money for the taxpayer across the life cycle of the asset and not just at the point of commissioning. This requires policy-makers and public procurers adopt a more holistic interpretation of the concept of value-for-money, which is the fundamental principle of public procurement. This is, of course, easier said than done. G-20 governments have developed a plethora of value-for-money tools and public sector comparators that certainly provide the basis for more informed decision making—not only regarding the bankability of projects, but also their longer-term affordability. The question that remains is how to value the non-financial benefits of sustainable infrastructure. These include resilience to natural disasters, avoided environmental and health care costs, increased productivity afforded by environmental design features and more.

To realize value for money across the asset life cycle, we also need to modernize procurement laws, regulations and standard bidding documents to allow tenders to be evaluated on whole-life value and the total cost of ownership. The European Union provides perhaps the best provisions in this regard, requiring that projects be awarded on the most economically advantageous tender.



European Union Directive 2014/24/EU, Article 67.1

The most economically advantageous tender from the point of view of the contracting authority shall be identified on the basis of the price or cost, using a cost-effectiveness approach, such as life-cycle costing in accordance with Article 68, and may include the best price-quality ratio, which shall be assessed on the basis of criteria, including qualitative, environmental and/or social aspects, linked to the subject-matter of the public contract in question.

To deliver sustainable infrastructure, there needs to be more concerted use of output- or performance-based specifications that detail the performance or the outputs desired rather than the products or technologies that are required to deliver on the performance. This approach is both innovation-friendly and efficient. It allows suppliers to combine best-available technologies and propose solutions that are efficient and cost-effective.

This is not to say that output-based specifications should not be precise and

measurable. They should. The challenge is to make them broad enough to encourage competition between different technologies and architecture and engineering designs.

The challenge with output-based specification, however, is that they carry the inherent risk of gold plating—when suppliers can continue to work on aspects well past the point where the extra effort is worth the value it adds. Sound forecasting on construction costs and careful allocation of design and construction risks are important to safeguard against this drawback.

Examples in designing output-based specifications

Specifications for rural electrification can enumerate the number of households to be connected and state preferences for renewable technologies. Suppliers can then determine between on-grid and off-grid technologies.

Specifications for urban transit can be technology-neutral but provide details on demand and throughput. Suppliers can then propose options ranging from light rail, monorail, bus rapid transit etc., based on demand patterns and urban context.

A specification for roads that prioritizes lowered maintenance costs can encourage bids that include energy-efficient lighting, weather-resistant road surface materials and environmentally-preferable siting and design in terms of the surrounding environment and topography.



There is also much value in asking what is needed, as opposed to what can be procured. Solutions to address the infrastructure bottleneck can often be found by upgrading and expanding existing infrastructure. For example, reducing leakage and theft improves water distribution systems, upgrading transmission and distribution infrastructure saves money compared to building new power plants, and automated highway tolls can increase throughput and reduce congestion on roads. Careful consideration of such opportunities can result in important costs savings—good procurement is ultimately all about efficient spending decisions.

To further accelerate the rollout of sustainable infrastructure, emerging procurement strategies such as pre-commercial procurement and first-commercial procurement can be particularly valuable. Pre-commercial procurement refers to instances when the public sector tenders for and acts as the first-time buyer of solutions and applications that are still in development. Similarly, first-commercial procurement refers to instances when governments share the risks of road testing

new technologies. In the EU, both pre- and first-commercial procurement have been used to increase innovation and efficiency in the water and transport sectors.

And finally, it is important that governments systematically tender when they seek to procure public infrastructure. Public tendering provides for price discovery, thereby increasing efficiency and driving industrial innovation in a significant manner. Systematic tendering also reduces opportunities for collusion and bid rigging. It is therefore particularly disturbing to observe the rise in unsolicited proposals. The Public-Private Infrastructure Advisory Facility’s 2014 study *Unsolicited Proposals—An Exception to Public Initiation of Infrastructure PPPs: An Analysis of Global Trends and Lessons Learned* reports that over 85 per cent of UN member states reviewed have chosen to allow unsolicited proposals (PPIAF, 2015)

Taken collectively, the public procurement of goods, services and infrastructure is equivalent to significant proportions of GDP. Unless these sums are deployed wisely, governments, citizens and investors will all be shortchanged.

TABLE 2: Procurement as a Percentage of GDP (approximate)

Brazil	32%
Mexico	7%
United States	11%
Canada	12%
India	30%
South Africa	29%
China	58%
Japan	13%
European Union	16%

Source: IISD and Organisation for Economic Co-operation and Development (2011)

7

FOCUS ON SUSTAINABLE INFRASTRUCTURE





“Climate change is no longer just about the future that we’re predicting for our children or our grandchildren; it’s about the reality that we’re living with every day, right now... We are the first generation to feel the impact of climate change and the last generation that can do something about it.”

U.S. President Barack Obama, August 3, 2015 (Office of the Press Secretary, 2015)

WHY FOCUS ON SUSTAINABLE INFRASTRUCTURE

What constitutes sustainable infrastructure?

- **Assets that are designed and built to be resilient to climate change, sensitive to the ecological characteristics of sites, water, energy, greenhouse gas- and material-efficient, and provide for long-term durability and efficiency.**
- **Assets that are designed through participatory processes and built through supply chains that comply with core labour and human rights standards of the International Labour Organisation.**
- **Assets that are bankable and affordable over the longer term and yield value for money for taxpayers and investors across their life cycles.**

Infrastructure serves as the lifeline for economic property, and it is a lifeline that must be built and managed in a manner that fuels social cohesion and cares for the earth’s natural systems. Put differently, infrastructure must be designed and built to provide efficient and reliable services for decades while being resilient to environmental and economic shocks. This implies that infrastructure that is durable; reduces reliance on materials, water and energy; builds skills; and creates jobs will contribute to (rather than endanger) the industrial and economic prosperity of an economy.

Sustainable infrastructure also calls for systemic improvements in thinking about how projects are designed and implemented. It forces regulators, investors, promoters and politicians to reckon with the full range of uncertainties involved in building infrastructure. Indeed, only when sustainability is built into infrastructure by design can trade-offs be determined on competing investment priorities.

Planning for sustainable infrastructure ensures that all risks are predicted and managed early in the project life. Investors are shy of risks related to geographically and socially inappropriate architecture and engineering, land acquisition, environmental and social impact assessments, building permits and construction delays. Similarly, uncertainties related to demand forecasts, backtracking on investment incentives ahead of schedule and changes in feed-in tariffs cause deep concern. Again, sustainability acts as an early warning system for stakeholders to build in contractual and fiscal safeguards to allocate risks to counterparties that are best able to assume them.

Perhaps the most compelling reason to prioritize sustainable infrastructure is its potential to address social inclusion. We have all read and debated on the IMF statistic that the 85 richest people in the world control as much wealth as the poorest half of the global population, that is 3.5 billion people. Given that gross fixed capital formation ranges from 18 per cent to 27



per cent of GDP (World Bank 2011–15), planning and implementing sustainable infrastructure have the potential to address this disparity.

Traditional infrastructure planning narrowly focuses on designing assets based on engineering designs and demand forecasts. A highway is planned to transport commuters from one destination to another and its bankability is costed based on simulated traffic volumes, patterns of use and the willingness and ability of the commuters to pay.

Sustainable infrastructure planning would, however, challenge stakeholders to site, design, build, operate and maintain the road to expand its relevance to the region where it is being built.

For example, buildings can not only be resource-efficient but be designed in sync with the surrounding geography, be it a coastal area, desert, mountain region or prairie. Building sustainable highways can become feats in urban development and special planning. Roads can be designed to increase access to new jobs, provide new opportunities to trade, new factories to manufacture in and new labs to innovate in. Standards such as the Greenroads Rating system can be used to reduce the asset's overall environmental footprint, provide for wildlife-integrating pavements, increase options for non-motorized traffic and optimize the use of greener building materials. Building infrastructure in this manner generates much greater stakeholder buy in. It also give rise to a range of positive externalities in terms of avoided environmental damage and human health costs, lowered greenhouse gas emissions, lower toxicity, increases in “green” jobs and, ultimately, GDP.

But most importantly, planning and implementing infrastructure in a sustainable manner ensure that the entire project is de-risked across its life cycle. Ironically, it is indeed the positive externalities that discernibly reduce investment risks over the 30-plus years typically involved in concession agreements.

When financing sustainable infrastructure, however, a number of challenges arise. Firstly, sustainable infrastructure usually costs more to design and build, given that:

- Geographically appropriate siting and design and resource-efficient building materials are more expensive than their more mainstream counterparts.
- Planning projects to be socially inclusive is time- and resource-intensive.
- The upfront technology risks of sustainable technologies and techniques are high given that they do not have sufficiently long track records that are backed up by monitoring and verification baselines.

Even though we can model the potential gains that sustainable assets can generate during their operation phase (in terms of energy efficiency, lower maintenance costs, increase durability, productivity and aesthetics), the inherent risks involved in planning and construction make it difficult to build these assumptions into project finance and bankability analyses.

This does not mean that there is no investor appetite for sustainable infrastructure. In 2014, the issuance of green bonds reached USD 36.59 billion, and in early November 2015 issuances reached USD 33.03 billion. (Climate Bonds Initiative, 2014). An almost bewildering array of sustainability decision-support tools, calculators, rating and certification schemes, and guidelines abound, from all parts of the world and for most sectors.



Perhaps what are now needed are dedicated credit-enhancement instruments to reduce the upfront planning, design and construction costs of green assets.

Can we consider viability gap funds that award and offer additional top-up for financing sustainable infrastructure?

Can we consider dedicated take-out financing for banks to finance sustainable infrastructure?

Can we consider “greening” accelerated depreciation for greener and cleaner plant equipment and machinery?

Can we consider partial risk guarantees, or even dedicated first-loss provision and

contingent loans for specific and certified sustainable assets? These can be used to back up technology and performance guarantees from suppliers.

In 2014, IISD conducted a survey on credit-enhancement instruments for green infrastructure and found that stakeholders remain preoccupied with the looming infrastructure gap and the low pipelines of bankable projects—the opportunities of green infrastructure did not even enter the equation. This is indeed a great pity, as it is only through the deployment of sustainable infrastructure that we can hope to address the global infrastructure deficit and plan for a more resilient tomorrow.

The Value of Natural Capital for Infrastructure Development

Water-related ecosystem economic value

Water-related ecosystem services perform an infrastructure-like function, such as wetlands filtering contaminated water, mangroves protecting shorelines from extreme weather events, floodplains absorbing excessive storm waters and lakes storing large water supplies. Yet they are not built infrastructure; these natural water infrastructures are shaped, grown, eroded, or deposited by nature. Working with nature can optimize the performance and financial benefits of engineered infrastructures. An academic study valued the societal benefits of natural water infrastructure services (wetlands, lakes and rivers) at USD 125 trillion per year as of 2011 (Costanza et al., 2014).

Mangroves’ economic value

The annual economic values of mangroves globally, estimated by the cost of the products and services they provide, has been estimated to be USD 200,000 to USD 900,000 per hectare. In India and Malaysia, for example, the value of mangroves just for storm protection and flood control has been estimated at USD 300,000 per kilometre of coastline, based on the cost of replacing the mangroves with rock walls (Perera et al., 2014).

Forests’ economic value

The non-timber value of forest cover in Himachal Pradesh in India has been estimated at approximately USD 1.9 billion (Verma & Kumar, 2008). As Himachal Pradesh’s forest cover in 2001–2002 was estimated at 1.4 million hectares, this would mean an average value per hectare of approximately USD 1,357. Adding the value of timber to this would take the total value of one hectare of forest to approximately USD \$8,500.

8

GREEN ACCELERATED DEPRECIATION





To deploy sustainable infrastructure, investors and developers need fiscal and performance-based incentives to design assets that are climate-resilient, energy- and water-efficient, use less toxic materials, give rise to less waste during construction and ultimately, cost less to own, operate and manage. Providing such incentives is important because designing and building sustainable assets can cost around 10 per cent to 30 per cent more than less sustainable alternatives.

For example, the Greenroads Rating System—a standard for building roads and highways that have lower environmental footprints and higher social multipliers—requires rated projects to lower hazardous waste by 20 per cent and use 10 per cent less water and energy during construction. Additional requirements include modular pavements, road safety features, local community involvement, biodiversity preservation and much, much more (Greenroads Rating System, 2014). Similarly, the growing demand for green hospitals entails not simply the greening of hospital buildings, but also the recycling of hospital waste, the use of medical products and devices with lower toxicity footprints, the sourcing of pharmaceuticals from suppliers using environmental management etc.

Building and managing such assets is expensive. They require higher project preparation budgets and additional capital to design and build. Because these assets will include pioneering technologies and systems, the capital outlay becomes even higher. Risk allocation and deal structure are also more complex given the perceived risks associated with these green and innovative technologies.

There is one solution to address this challenge, at least in part: accelerated depreciation for green infrastructure assets.

Accelerated depreciation is a standard feature in the mix of fiscal and financial investment incentives offered by almost every country around the world. It provides for the on-balance-sheet depreciation of assets at a faster schedule than is available outside that asset class. This is done by allowing higher tax allowances or increased depreciation rates in the early years of the life of an asset. This enables investors to depreciate fixed assets faster, so earnings, balance sheets and tax statements will be calculated according to a lower—and even truer—value of these assets.

Investors appreciate accelerated depreciation as it allows for greater upfront investment that can be recuperated over a shorter period of time. It is also a preferred option for policy-makers, as it is easy to administer and requires no changes in accounting practices. It is important, however, that administration takes place through the tax code; otherwise, this incentive can be highly prone to abuse.



Allowing investors to accelerate the depreciation of green assets and green technologies would go a long way to de-risking green infrastructure and accelerate its deployment.

Because accelerated depreciation will reduce tax revenues, policy-makers can be skeptical and consider this an expensive measure. However, they need to remember that any loss of tax revenue will be more than compensated by the reduced costs of healthcare, higher productivity related to better air quality and lowered bills from natural catastrophe damage.

IISD has modelled the economic and environmental gains that the government of China could realize if the country were to use less carbon-intensive grades of cement, a significant factor, given that China used more cement between 2011 and 2013 than the United States used in the entire 20th century (Washington Post, 2015). IISD found that the avoided environmental costs were equivalent to CNY 349 billion (Dion et al., 2015). Indeed *The Guardian* reported in September 2013 that China projects environmental damage to cost 3.5 per cent of GDP, while KPMG estimated that in 2008 the 3,000 largest publicly traded corporations caused USD 2.15 trillion in environmental damage.

In 2007, the Property Council of Australia undertook a preliminary analysis of the impacts of implementing a green depreciation scheme—a provision on accelerated depreciation for buildings that meet a specified environmental standard. The objective was to provide an incentive for the owners of non-residential properties to refurbish existing buildings. The results of the investigation revealed that the Australian government will forego AUD 568 million over four years in terms of reduced tax revenues. In return, this measure would lead to the abatement of 203 million tonnes of carbon dioxide over 11 years. If the price of carbon was valued at AUD 11.34 per tonne⁹ or above, the green depreciation scheme would certainly be cost effective (Centre for International Economics, 2007).

⁹ The carbon trading price in the EU in 2007 was AUD 35 per tonne.

Conclusion





Addressing the global infrastructure deficit is critical, as the costs for inaction are simply too high.

Increases in GDP and the Human Development Index are intrinsically linked to improvements infrastructure. The most pressing global challenges— income inequality, reducing greenhouse gas emissions, adaptation to changing climates and more recently, the largest movement of people since World War II—require that we not only upgrade and expand infrastructure stocks but also make them accessible to large cross-sectors of the global population.

The G-20 2015 provides us with a window of opportunity to take action. Interest rates are low and will likely continue to remain on the lower end in the coming months. The 2030 global development agenda moving forward will be framed around the 17 Sustainable Development Goals, many of which require infrastructure investment in the immediate term.

IISD is of the view that the best place to start is to increase the expertise of all governments—federal, provincial and municipal—to prepare bankable infrastructure projects and generate project pipelines. In doing so, they will intrinsically realize the importance of making projects bankable, and just as critically, the importance of ensuring that these assets will be appropriate and affordable to the communities and stakeholders that they are built to serve. The infrastructure deficit will only be addressed if governments also become deal makers and seek value-for-money for the taxpayer, not simply at the point of commission, but post-construction, across the user-life of the asset.

The next point of action could well be targeted at domestic financing and delivery capacities. Governments are quick to

announce infrastructure investment targets, but they are rarely backed up with analyses of whether or not the domestic market has the capacity to indeed attract capital, enter into joint ventures, structure deals and take on construction risks.

As project pipelines take shape, policy-makers and investors will both begin to realize the value of planning infrastructure assets in a manner that is in sync with wider special planning, urban and rural development priorities. Indeed, an understanding of parallel development programs and how they may deliver on competing priorities will be essential to bankability. For example, forecasting traffic when planning a highway project will indeed have to consider if railways, airports or indeed other non-toll roads are also being envisioned.

In preparing for optimal risk allocation, governments and policy-makers need to go to market with projects where the environmental and social safeguards are inherently integrated into the design of the asset. This will go a long way to reduce legal and regulatory risks and indeed, increase the transparency and accountability of the ensuing tender processes. Integrating safeguards at the preliminary planning stage will also make the asset more sustainable, increase opportunities to build in the use of green technologies and increase buy-in from local communities. As a result, the entire project will be significantly de-risked across its entire life cycle.

We are concerned that the debate on infrastructure is too focused on the financing challenges, rather than on the premise that good money will follow good opportunities. If bankable projects enter the market, private and institutional investors will indeed follow.



Why Infrastructure is Key to Realizing the Sustainable Development Goals (SDGs)

SDG 1—End poverty in all its forms everywhere. The targets relate to access to basic services, building resilience and reducing vulnerability to climate-related extreme events, and other economic, social and environmental shocks. Bankable infrastructure education, healthcare, water and energy underpin the delivery of the goal. Moreover, these public assets need to be apportioned to country needs and be resilient to the impacts of changing climates.

SDG 2—End hunger, achieve food security and improved nutrition and promote sustainable agriculture. The targets refer to an increase in investment for rural and social infrastructure.

SDG 3—Ensure healthy lives and promote well-being for all at all ages. Target 3.8 focuses on access to quality essential healthcare services. This is likely to add more focus on PPPs in healthcare and the “greening” of health services.

SDG 4—Ensure inclusive and equitable quality education and promote lifelong learning opportunities. Target 4.a demands the construction and upgrading of learning facilities. Investment in education and continued skills building will be paramount. We are likely to see continued interest from private and “impact” investors in education-related opportunities.

SDG 5—Achieve gender equality and empower all women and girls. Target 5.4 points to the need for provision of public services and infrastructure for social protection of unpaid care and domestic work. Investment in rural healthcare and education, particularly targeted at women and girls, is at the core of gender equality.

SDG 6—Ensure availability and sustainable management of water and sanitation for all. This goal and the underlying targets focus on availability, access and sustainable water management. Water is one of the most underinvested sectors and indeed one where all risks—political, regulatory, technology and revenue—are perhaps the highest.

SDG 7—Ensure access to affordable, reliable, sustainable and modern energy for all. Targets 7a and 7b refer explicitly to the promotion of investment in and expansion of energy infrastructure. Energy forms the backbone for economic and social property. The challenge is to de-carbonize the energy sources and move towards more decentralized energy infrastructure.



SDG 9—Build resilient infrastructure, promote sustainable industrialization and foster innovation. This goal emphasizes the importance of developing quality, reliable, sustainable and resilient infrastructure to support economic development and human well-being. This includes the need for upgrading and retrofitting existing infrastructure to make it sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes. This emphasizes that infrastructure projects must be bankable and bring value-for-money during operation.

SDG 11—Make cities and human settlements inclusive, safe, resilient and sustainable. There is renewed recognition that cities, as custodians of decentralized public budgets, will be the catalysts in delivering equitable and sustainable lifestyles. The first challenge will be to increase expertise of city planners on project preparation and deal structure.

SDG 12—Ensure sustainable consumption and production patterns. Target 12.7 brings to the forefront a major caveat in the infrastructure planning cycle—public procurement. Even the best-structured deals will fail if the procurement processes do not provide for price discovery and reward innovation and efficiency.

SDG 13—Take urgent action to combat climate change and its impacts. This goal implies that infrastructure will have to be built to better withstand natural disasters and, in tandem, reduce its greenhouse gas footprint

SDG 17—The means of implementation of the SDGs and post-2015 agenda. The targets refer, among others, to multistakeholder partnerships. Expectations to crowd in private capital into private infrastructure is set to continue.

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