MARSH & McLENNAN COMPANIES | Asia Pacific Risk Center

CLOSING THE FINANCING GAP

INFRASTRUCTURE PROJECT BANKABILITY IN ASIA

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KEY TAKEAWAYS

1. In Asia, the public sector cannot fund the region's future infrastructure needs on its own. Currently, the sector funds 90 percent of infrastructure development in the region. To meet the $26 trillion investment that is required in developing Asia by 2030, this status quo needs to change.

2. There is ample private capital available globally to meet this demand. Global institutional investors currently manage more than $50 trillion. Investments in infrastructure assets, with theoretically stable cash yields over time, can often be attractive even to investors with long-term liabilities.

3. In reality however, global investors have global alternatives, and infrastructure projects across much of Asia rarely rank as the most attractive option to deploy capital on a risk adjusted basis – there is simply too much risk and uncertainty over investment returns.

4. The problem is not that these projects represent an acceptable level of return, but are simply beaten by even higher returns in other asset classes elsewhere. The problem is that the majority of infrastructure projects in emerging markets, we calculate 55-65 percent, are fundamentally not bankable without government or multilateral development bank support.

5. Consistent adherence to the set of bankability guidelines outlined in this report, coupled with the deepening of national capital markets, could markedly change the outlook for infrastructure investment in the region by creating a pipeline of bankable projects.

6. The burden of responsibility to effect change sits with national governments across Asia. Many countries have begun making changes in line with international best practice, but neither the volume nor the pace of change has been enough.

7. Institutional investors must also change, but are well placed to do so at a faster rate than governments. Asia is a diverse region and investors that want to outperform the market over time will have to concertedly grow their local knowledge and capabilities.

8. The infrastructure financing gap is not new, but it continues to grow rapidly. The limited success of previous initiatives to transform the investment environment in the region must not dampen enthusiasm for action now. The chance to transform the economic prospects of nations and their citizens is too large a prize to ignore.

In this report, the term "Developing Asia" refers to the Asian Development Bank's 45 Developing Member Countries from across Central Asia, East Asia, South Asia, Southeast Asia and The Pacific. Notable exclusions from this group of 45 countries include Australia, Japan and New Zealand.

Note: In this publication, "$" refers to US dollars.

TABLE OF CONTENTS

INTRODUCTION

In many ways, Asia has become a growth engine for the world economy, with developing Asia currently driving 60 percent of global growth.[1] Southeast Asia will see the fastest growth in vehicle ownership globally in 2017[2] and the broader Asia region as a whole leads in air passenger growth[3] as well. Average Gross Domestic Product (GDP) growth in developing Asia is expected to be 5.7 percent in 2017 and 2018, compared to just 1.9 percent in the Euro area, the US and Japan.[1]

The expected GDP growth is driven in part by an estimate of one million young people entering the workforce each month in South Asia,[4] and in part by countries like Vietnam, which is forecast to experience a record year of foreign direct investment.[5]

Given this overall boom, it is no surprise that the Asian Development Bank forecasts that the region requires $26 trillion of investment in infrastructure over the period 2016-2030. However this expected demand is tempered by a reality in which there are significant uncertainties over where the money to fund this development will come from. The financing requirements are so large that a fundamental shift will be needed in how infrastructure projects are financed in a region where the public sector has historically covered over 90 percent of needs. Countries in the region that want to meet their required investment needs over the next decade and beyond, will have to attract funds from global institutional investors who, to date, have generally been wary of infrastructure investment in emerging markets.

Project bankability in Asia has been a key concern for investors in infrastructure for many years. Marsh & McLennan Companies' Asia Pacific Risk Center estimates that between 55-65 percent of projects in Asia are not bankable without support from government or multilateral development banks. This report seeks to address the many challenges of project bankability in the region, by introducing a set of guidelines based on the combined expertise of Marsh & McLennan Companies' operating companies: Oliver Wyman, Marsh, Mercer and Guy Carpenter.

Section 1 sets the context for the boom in infrastructure demand in Asia. Section 2 looks in more detail at the drivers and challenges associated with infrastructure financing in the region, including the inadequacy of the current public sector driven financing model based on forecasted future requirements. Section 3 sets out the bankability guidelines which consist of six levers that reflect the ideal environment (created by governments) and best practice execution (conducted by investors) for infrastructure investment. The report concludes by looking at the successful application of these levers across key industry sectors and within selected countries with high infrastructure investment growth expectations.

INFRASTRUCTURE TRENDS IN ASIA

TOTAL INFRASTRUCTURE INVESTMENT IN THE REGION HAS GROWN BY ALMOST THREE TIMES OVER THE LAST DECADE, FROM $0.6 TRILLION IN 2006 TO $1.6 TRILLION IN 2015

ASIA DRIVING GLOBAL INFRASTRUCTURE SPEND

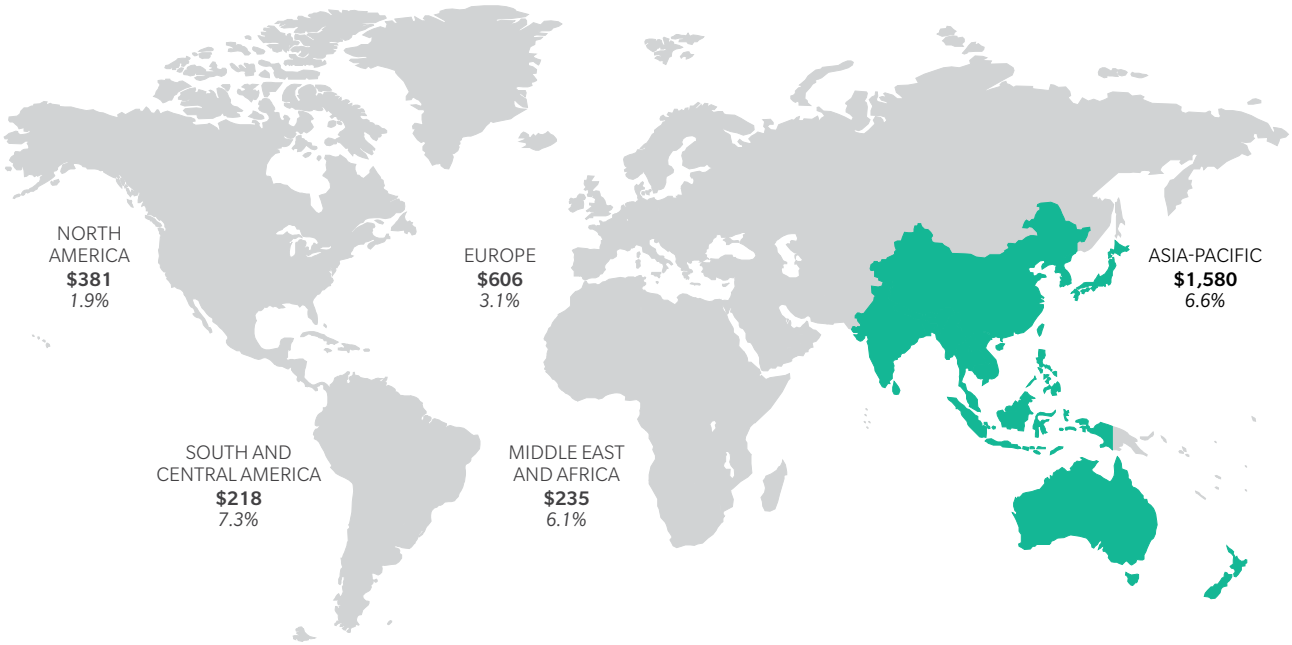
Globalization and the rapid industrialization of the BRIC economies have seen total global infrastructure investment almost double over the last decade, rising from $1.7 trillion in 2006 to more than $3 trillion in 2015.

The scale of investment in infrastructure development varies significantly between regions. The Asia-Pacific region spent the most on infrastructure in 2015, accounting for over 52 percent of global infrastructure spend, and 6.6 percent of its Gross Domestic Product (GDP) (see Exhibit 1). In contrast, North America accounted for only 12 percent of global infrastructure spend, and 1.9 percent of its GDP.

While the United States is expected to increase spending on infrastructure in the coming years following President Trump's announcement of $200 billion of government funding to help revitalize US roads, bridges and airports, this will not significantly impact the split of regional investments given China's current and predicted spending levels at home and abroad. Already accounting for over half of Asia-Pacific's total spend on infrastructure, China's Belt & Road Initiative is a global trade project that will see the country refocus its infrastructure investment internationally in the coming years.

EXHIBIT 1: INFRASTRUCTURE SPENDING – TOTAL, AND AS A PERCENTAGE OF GDP

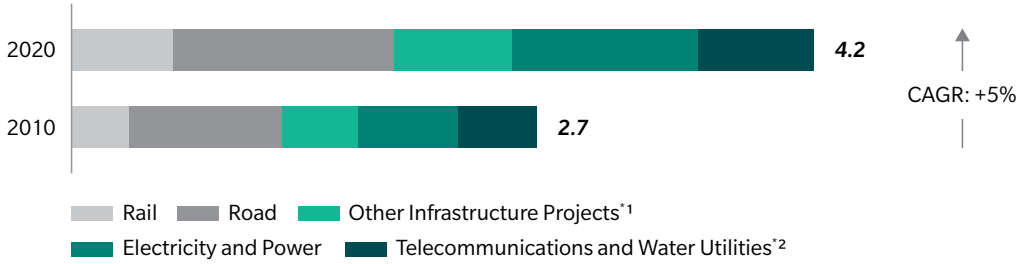
$ BILLIONS, 2015 ESTIMATES



Source: APRC analysis of data from Construction Intelligence Center

EXHIBIT 2: GLOBAL INFRASTRUCTURE SPEND – SECTOR BREAKDOWN

$ TRILLIONS, 2010-2020



*1 Includes airports, dams, ports, land control systems, and inland waterway infrastructure
*2 Includes telecommunications, sewage infrastructure, and water infrastructure
Source: APRC analysis of data from Construction Intelligence Center

The ability of China to finance such a grand plan has been questioned, as has the country's true motivations behind the scheme, but if the majority of the plan comes to fruition then the new projects will ensure that the current oversupply in many state run Chinese metal industries is reduced.

Japan and India also contribute notably to the region's infrastructure spend, though based on 2015 figures they are a distant second (14.4 percent) and third (11.5 percent) respectively. Many Southeast Asian economies such as Indonesia, Thailand, the Philippines, and Vietnam, where infrastructure spend is still relatively small, have all announced ambitious plans to enable further economic development via greater infrastructure investment.

In terms of the magnitude of finance needed, the critical financing requirements of developing Asia remain in power, followed by transport. These sectors form the economic backbone for societies.[7]
Rana Hasan, Director of the Development Economics and Indicators Division, Asian Development Bank

Pairing this renewed focus on infrastructure and supporting reform vigor with the broad regionalization efforts of the ASEAN Economic Community (AEC) 2020, we expect Southeast Asian economies to emerge as an additional growth engine for infrastructure in the region.

ROAD INFRASTRUCTURE PAVED THE WAY, BUT ELECTRICITY CATCHES ON

With different regions of the world varying in their specific infrastructure needs, all sectors are expected to experience healthy growth in the period 2010-2020 (see Exhibit 2). Globally, the road infrastructure sector is expected to continue leading in investment spend in 2020. However it is expected to have reduced in size relative to its position in 2010, due to investments in faster growing sectors like telecommunications, and electricity and power. At a regional level, it is the electricity and power sector that will see the greatest increase in levels of investment and overtake road infrastructure sector as the largest sector by infrastructure spend in Asia-Pacific by 2020 due to a combination of population growth, increasing urbanization and a growing middle class.

EXHIBIT 3: DIFFERING INFRASTRUCTURE NEEDS ACROSS ASIAN ECONOMIES

MATURE ECONOMIES

- Mature markets need to refurbish ageing infrastructure to cater to population growth and economic expansion
- Focus is on meeting social needs like education, healthcare and housing as well as improving transport links and addressing energy supply security concerns
- Examples: Singapore, Japan, Australia

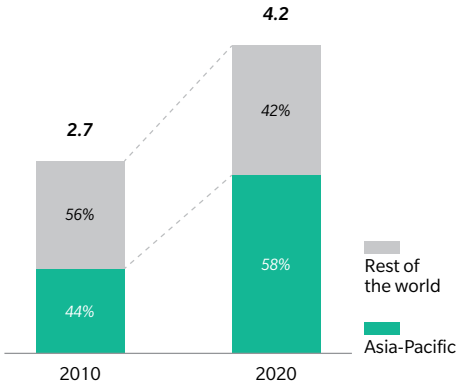
EMERGING ECONOMIES

- Emerging markets need new infrastructure to support increasing urbanization and global trade
- Priority is building economic infrastructure to meet transportation and utility needs
- Examples: China, India, Indonesia, Thailand

Source: APRC analysis

EXHIBIT 4: ASIA-PACIFIC VERSUS GLOBAL INFRASTRUCTURE EXPENDITURE

$ TRILLIONS, 2010-2020



Source: APRC analysis of data from Construction Intelligence Center

At an individual country level, the demand for each type of infrastructure does vary relative to the stage of development of the nation. In the more mature economies (see Exhibit 3), demand has often moved beyond core energy access and transportation concerns into broader social infrastructure needs. Where the demand exists for energy investments this is often driven by a clean energy agenda which has significant financing and regulatory implications. Emerging economies in the region are more likely to be focused on achieving basic energy access targets, given that there are still some 700 million people in the region without access to electricity, or improving transport connectivity.

THE INCREASINGLY IMPORTANT ROLE OF MULTILATERAL DEVELOPMENT BANKS (MDBs)

Multilateral development banks (MDBs) are increasingly financing large infrastructure projects in the region. Both the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB) are expected to each finance $2.5 billion of infrastructure projects in 2017.[8] In 2016, AIIB approved $800 million of funding for nine infrastructure projects, of which five were within Asia-Pacific. Similarly in 2016, the NDB approved $1 billion of funding across four Asia-Pacific infrastructure projects.

Infrastructure spend in the Asia-Pacific is expected to more than double relative to a decade earlier, to reach $2.5 trillion in 2020, accounting for almost 60 percent of projected global infrastructure spend (see Exhibit 4). The cumulative annual growth of about 8-10 percent is expected to be driven by the twin engines of economic development and changing demographics. Led by China and India, Asia-Pacific is projected to contribute close to half of global infrastructure spending by 2020, up from less than 30 percent in 2010.

In 2016, AIIB approved nine infrastructure projects, of which five are within the Asia-Pacific, with a combined financing amount of about $800 million from AIIB itself. Similarly, NDB has, in 2016, approved four Asia-Pacific infrastructure projects out of their seven approved projects, with a total financing amount of about $979 million (63 percent of the total approved amount).

HOW ARE PROJECTS BEING FINANCED

IN ASIA, THE PUBLIC SECTOR FINANCED OVER 90 PERCENT OF THE REGION'S INFRASTRUCTURE INVESTMENT

The world spends about $2.7 trillion annually on infrastructure.[9] Public financing accounts for 45 percent – 40 percent from government budgets, 5 percent from multilateral development banks (MDBs) – and private sector investments make up the remaining 55 percent (see Exhibit 5).

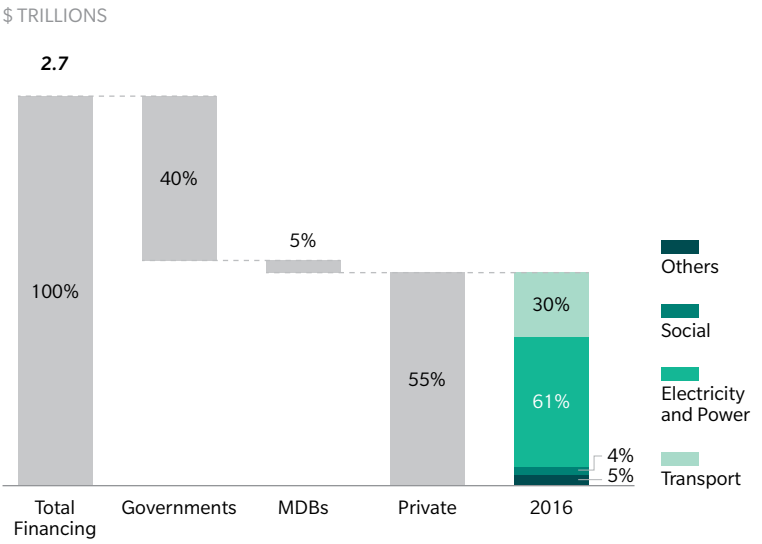
However, this breakdown differs significantly when comparing emerging markets with developed economies. World Bank estimates 70 percent of infrastructure projects in emerging markets are financed by government budgets, 10 percent by MDBs,[10] and the remaining 20 percent by private players. In Asia, Asian Development Bank (ADB) estimates public financing make up about 92 percent of the region's infrastructure investment.[11] These are in stark contrasts to developed economies where the split between public and private sources is about 30:70.[10]

Public capital is largely derived from governments and MDBs, the latter being institutions created by groups of countries to provide financing and professional advice for the purposes of infrastructure development. Examples of MDBs include World Bank, ADB, and Asian Infrastructure Investment Bank (AIIB) which inaugurated in early 2016.

Private capital, however, is typically arranged via corporate finance or project finance. Corporate loans are still prevalent in emerging markets, where the private infrastructure company (or state-owned company) takes loans directly instead of ring-fencing this away from other assets. Listed companies tend to owners or investors in these infrastructure projects, or providers of the infrastructure services.

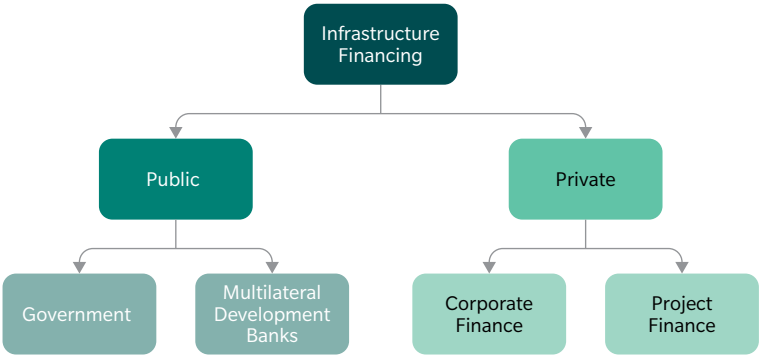
Project finance is becoming increasingly common in certain markets, as it is often the most efficient financing arrangement for public-private partnership (PPP) projects.

EXHIBIT 5: BREAKDOWN OF GLOBAL INFRASTRUCTURE FINANCING



Source: APRC analysis of data from Asian Development Bank, World Economic Forum, World Bank, and InfraDeals

EXHIBIT 6: SOURCES OF INFRASTRUCTURE FINANCE



Source: APRC analysis

UNDERSTANDING PUBLIC-PRIVATE PARTNERSHIPS (PPPs)

While there is no standard, internationally accepted definition for the wide range of types of agreements between the public and private sector entities, the term "public-private partnership" has been used to describe this class of deal structure. PPPs are typically characterized by high specificity, low re-deployable value, and high intensity of capital. They are agreements wherein the public sector (government entities – including ministries, municipalities, and state-owned enterprises) procure and construct public infrastructure by tapping relevant financial or technical expertise and operational efficiencies of the private sector (businesses and investors).[12]

Usually done through a legally binding contractual arrangement, the partners engaged in the PPP agree to apportion responsibilities related to the implementation, management, and operation of the infrastructure project in an optimal way that allows risks to be allocated to the parties that are best able to manage them. Exhibit 7 showcases common risk allocation splits for projects in Asia. This project implementation mechanism generates cost efficiencies and improves performance.[13]

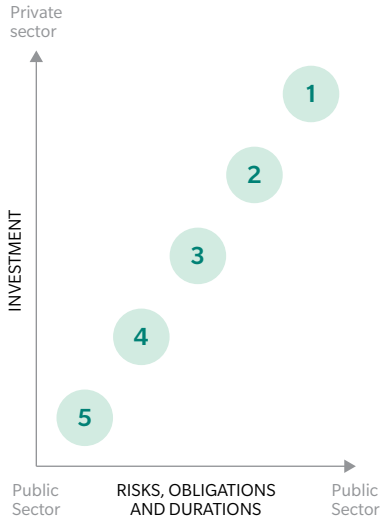
In this instance, a special purpose vehicle (SPV) is set up with contractual financing agreements between the partners. On the one hand, the private player is able to take on the management and operational roles of the project while working towards the clear goal of maximizing profits using its private sector expertise. On the other hand, the government can remain focused on its primary responsibilities, such as implementing regulations and providing supervision, while still fulfilling social obligations without having to deploy all its scarce public resources.[14]

Exhibit 7 shows five categories of PPP models that could either exist as individual options or in combination; the latter being more common in recent years. An example of a concession PPP project is covered later in our report under "Case study: Central Java IPP".

Although there are many benefits associated with PPP infrastructure projects, it is especially crucial to correctly identify sectors best suited to the PPP framework and ensure deal structure and risks are allocated to the right parties.

EXHIBIT 7: UNDERSTANDING PPP MODELS AND RISK ALLOCATION

BASIC FEATURES OF PPP MODELS



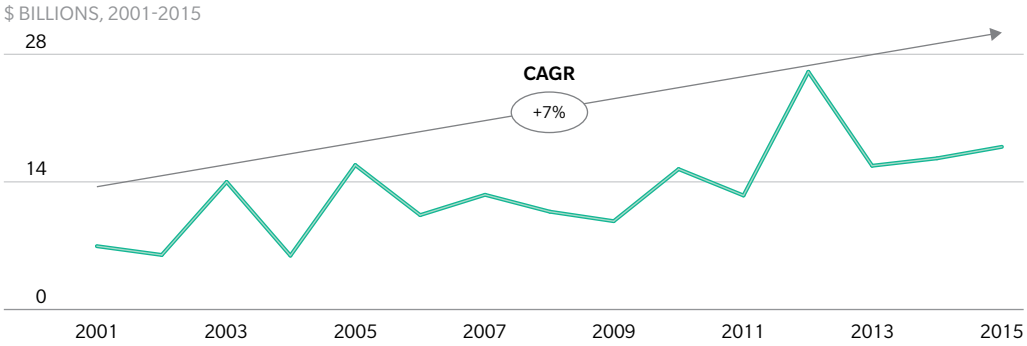
1. **Private Ownership:** The private sector is responsible for the design, construction, and operation of an infrastructure facility
2. **Concession:** In this form of PPP, the government defines and grants specific rights to an entity to build and operate a facility for a fixed period of time
3. **Leases:** The operator is responsible for operating and maintaining the infrastructure facility (that already exists) and services, but are generally not required to make any large investments
4. **Turnkey:** A traditional public sector procurement model for infrastructure facilities where a private contractor is generally selected through a bidding process and the contractor then assumes the risks involved in the design and construction phases
5. **Supply and Management Contract:** A contractual arrangement for the management of a part or whole of public enterprise by the public sector with the public sector retaining the ownership of the facility management

RISK ALLOCATION DECISIONS WILL IMPACT BANKABILITY ASSESSMENTS

	COMMON RISK ALLOCATION BY PARTY*1		
RISK	TRADITIONAL (DESIGN-BID-BUILD)	DESIGN-BUILD	PUBLIC-PRIVATE PARTNERSHIP
POLITICAL WILL AND REGULATORY	Public	Public	Public
PLANNING AND ENVIRONMENTAL APPROVALS	Public	Public	Public
CHANGE IN SCOPE	Public	Public	Public
PERMITTING	Public	Shared	Shared
UTILITIES	Public	Shared	Shared
LAND PURCHASE AND GROUND CONDITIONS	Public	Shared	Private
DESIGN	Public	Private	Private
CONSTRUCTION	Private	Private	Private
QUALITY ASSURANCE AND CONTROL	Public	Shared	Private
OPERATIONS AND MAINTENANCE	Public	Public	Private/Shared
MACROECONOMIC CONDITIONS	Shared	Private	Private
FINANCING	Public	Public	Private
DEMAND RISK	Public	Public	Public/Shared
FORCE MAJEURE AND SUPERVENING EVENTS	Public	Shared	Shared

*1 These allocations are general guidelines based on APRC analysis and can vary from project to project
Source: United Nations Economic and Social Commission for Asia and the Pacific's website, Federal Highway Administration website, APRC analysis

EXHIBIT 8: TOTAL PPP INVESTMENT IN ASIA-PACIFIC (EXCLUDING INDIA)



Source: APRC analysis of data from World Bank

PPPs GAINING MOMENTUM IN ASIA-PACIFIC

Over the years, there has been increasing interest in PPPs in Asia (see Exhibit 8) owing to strong economic development, population growth, and increasing urbanization. Due to the limited capacity of regional governments (constraints on their balance sheets and fiscal spaces) to finance the strong demand for infrastructure investment, governments have been committed to engaging more private players to finance these projects.

In 2015, four of the top 10 deals (by investment deal value) identified by World Bank were in Southeast Asia. While Malaysia was home to the biggest Southeast Asian deal (3B Jimah East coal-fired Power Plant project) worth about $2.7 billion, the Philippines bagged the other three spots with investment sizes of $1.2 billion (San Buenaventura coal-fired Power Plant project), $1 billion (Mactan-Cebu International Airport project), and $940 million (Thermas Visayas Power Plant project) respectively.[15] This is largely the result of a strong PPP operating environment in the Philippines after the introduction of a new PPP regime which has streamlined institutional roles. The Economist Intelligence Unit conducted a study to evaluate the environment for PPPs in Asia-Pacific in 2014 and ranked the Philippines seventh out of 21 countries.[16]

In terms of number of projects, it is no surprise that China currently has more planned PPP projects than all other countries in the world combined. According to the Ministry of Finance's PPP database, China currently has close to 12,000 official listings.[17] As private sector investment accounts for less than a third of these PPP projects,* the Chinese government is continuously exploring options to involve more private investors.

* According to Moody's Investor Service

WHAT INVESTORS LOOK FOR IN INFRASTRUCTURE

Though governments and financial institutions remain important brokers in infrastructure funding, the world needs to increasingly tap into private capital markets to address the growing infrastructure deficit. This is especially true owing to the reduced fiscal capacity most governments are faced with, due to budget constraints and reduced capital lending from financial institutions as a result of the new "Basel 3" capital regulations.

However, private financing is not straightforward and can come across as a multidimensional investment universe; different investors tend to assess the risks and returns of capital-intensive infrastructure investments differently.

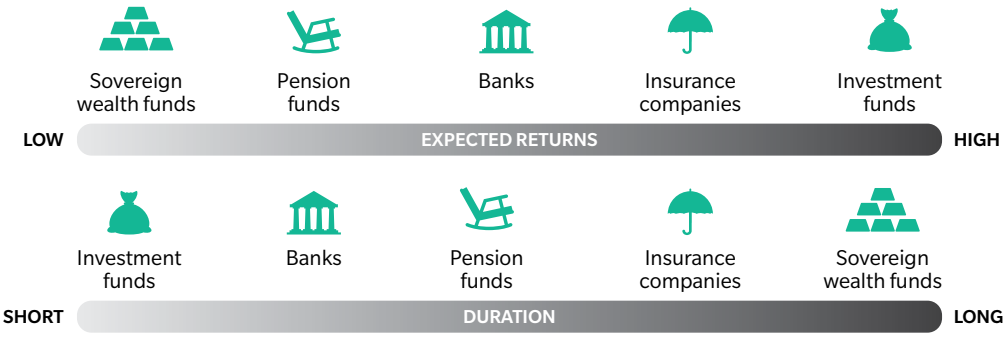
Infrastructure as an asset class provides for portfolio diversification and the potential for stable cash yields. It should therefore, in theory, appear as an attractive investment alternative for institutional investors (pension funds, sovereign wealth funds, insurance companies, etc.) that generally have long-term liabilities and low risk appetites. In reality however, the uptake of the expansive asset class has historically been limited.

For example, infrastructure asset allocation in 2014 only accounted for 0.8 percent of the $50 trillion managed by institutional investors globally.[9]

In order to increase institutional investors' commitments to the asset class, it is important to understand the different investment behaviors and preferences of different investor classes – ranging from duration, to return expectations, to type of investment grades. Exhibit 9 shows example investor preferences for expected returns and duration. These are indicative of general preferences as with the advent of some very long-term third party funds, for example, the lines often blur.

Most institutional investors continue to look for defensive diversification from their infrastructure allocations. In an Asian infrastructure project context, this necessitates effective structuring and risk transfer to high quality counterparties along with feasible options for managing currency exposures.
Toby Buscombe, Partner & Global Head of Infrastructure, Mercer Private Market

EXHIBIT 9: INDICATIVE PREFERENCES FOR INSTITUTIONAL INVESTORS



Source: APRC analysis

EXHIBIT 10: UNIQUENESS OF INFRASTRUCTURE INVESTMENTS TO INVESTORS

40%
DIVERSIFICATION

Investment returns are more stable and show a lower correlation with other asset classes than other types of investments (equities, fixed income, etc.)

20%
HIGHER RETURNS

Generally, infrastructure projects are natural monopolies with high barriers to entry. Upon completion of construction and subsequent development of demand patterns, projects have low payment and cash flow risks

12%
INFLATION HEDGING

Rates of return set by regulators are often linked to future inflation (at times, revenue can also be linked to inflation for greater protection)

IMPORTANT ASPECTS OF INFRASTRUCTURE COMPANIES TO INVESTORS

	FACTORS AND RANKINGS	IMPORTANCE RANKING (HIGHEST IS 5)
1	Stable regulation and contracts	4.2
2	Earnings stability	3.9
3	Counter-party risk	3.6
4	Greenfield versus brownfield	3.1
5	Earnings growth potential	3.0
6	Investment size	2.8

Source: APRC analysis of data from EDHEC Infrastructure Institute Singapore

Beyond yield and tenor, the Singapore Infrastructure Investment Institute also highlighted other key considerations from an in-depth survey, conducted in 2016, of investors' perceptions and expectations from investing in infrastructure.[18] The results suggest that these investors, with a broad geographic focus, are increasingly interested in infrastructure as an asset class and are more receptive towards its illiquid nature, likely a result of margin pressures in a low-interest rate environment. Viewing infrastructure through a different prism as that of the government, more than two-thirds of the respondents said they had intentions to increase their investment spend on infrastructure in the following years and four in five expect to maintain their investment over a time horizon of more than 10 years. To these investors, the project's attractiveness is largely dependent on the financial features summarized in Exhibit 10.

Unsurprisingly, the stability of regulatory and contractual frameworks emerged as the most important factor, followed closely by the stability of investors' returns on investments.

The ability to identify, quantify, and manage risks, both insurable and uninsurable, will largely influence equity investors' potential in formulating a winning bid; in addition to getting a desired risk-adjusted return on investments after satisfying the contractual requirements imposed by governments and capital providers. On the other hand, lenders need to be reassured that all project risks associated with their ventures have been identified, analyzed, and effectively controlled or transferred before agreeing to finance an infrastructure development project or operational asset.

GLOBAL INVESTORS HAVE GLOBAL ALTERNATIVES

Despite the increase in aggregate capital invested in infrastructure, this increment was not evenly spread across regions. Preqin reports that North America- and Europe- focused funds accounted for the lion's share of the 109 unlisted infrastructure funds that have reached financial close since January 2015. This represents 61 percent of the number of funds and 75 percent of the aggregate capital raised. Asia only represented about 14.6 percent of the $90.8 billion raised for infrastructure investment.[19]

The simple reason for such a weighting is that capital will flow to the best risk-adjusted format, and many global investors determine that their capital is better deployed outside of Asia. The specific reasons for such a decision will vary by country, industry and project; however the global investment numbers paint a clear picture of the impact of the often significant regulatory demands and operational risks faced when dealing in this region.

Expected returns for renewable energy projects in Asia-Pacific tend to be higher than for comparable projects in Europe or the US, particularly in the region's emerging markets.
Benjamin Haan, Head of Private Infrastructure, Asia-Pacific, Partners Group

Some hurdles that led to a lack of investor appetite in infrastructure projects in Asia include[10,20]:

- Unfavorable legal and regulatory frameworks
- Political instability and uncertainty
- Capital markets with low liquidity, currency volatility
- Illiquid nature of infrastructure assets
- Complex nature of the asset class – from both governance and operational standpoints
- Poorly structured projects without sufficient economic or technical viability
- Lack of data on prior infrastructure projects for benchmarking

One potential bright spot for Asia is in the renewable energy market, where Partners Group currently estimates that returns in Asia's emerging markets outperform more established markets, with yields of between 14-15 percent in local currency for operating assets, and up to 20 percent in local currency for development assets.[21]

THE $1 TRILLION FINANCING GAP

As mentioned earlier, the world currently spends $2.7 trillion annually on infrastructure investments. However, it has been estimated that going forward, a staggering annual spend of $3.7 trillion is required in order to maintain and support global economic growth.[9] Not surprisingly, the financing gap is significantly higher where infrastructure investments are needed the most: in emerging countries, where infrastructure spend is highly skewed towards public finances due to a mismatch between volume of investable assets and investor appetite, as previously discussed.

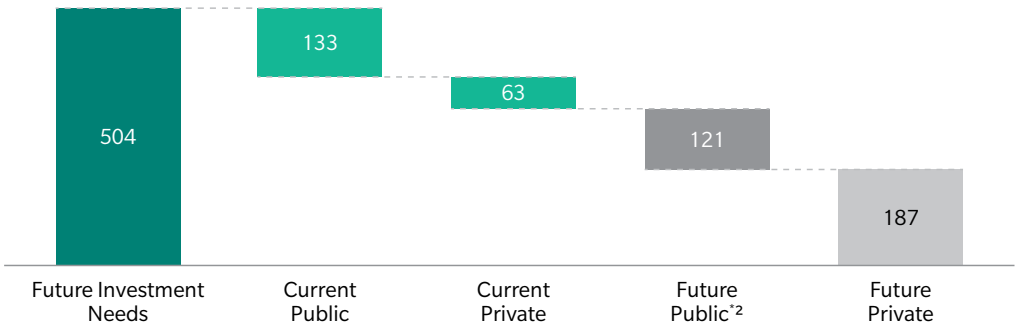
ASIA ACCOUNTS FOR ALMOST HALF THE GAP

A report published by ADB in March 2017 estimates that developing Asia will need to invest about $1.7 trillion per year in order to maintain a growth trajectory that sufficiently eradicates poverty.[4] This is more than double that of ADB's 2009 estimate; with the inclusion of climate-related investments being a major contributing factor.† Of that annual investment spend needed, more than 60 percent is required by East Asia, followed by a quarter for South Asia, and 12 percent by Southeast Asia. This large disparity in annual investment needs is attributed to the difference in the sub-regions' economic development, growth prospects, and existing levels of infrastructure.

The $881 billion infrastructure spend by the 25 Developing Member Countries (DMCs) is well below the projected annual investment needs of $1.34 trillion over the five-year period from 2016 to 2020, resulting in an annual gap of about $460 billion.‡ Excluding China, this gap shrinks by a third to $308 billion (Exhibit 11).

EXHIBIT 11: MEETING THE INVESTMENT GAPS – SELECTED ADB DEVELOPING MEMBER COUNTRIES*1

ANNUAL AVERAGES, $ BILLIONS, 2016-2020



*1 Climate-adjusted estimates
*2 Future public investments are based on the 50 percent fiscal space assumption
Source: Asian Development Bank

† Other important factors that contribute to this increase are the inclusion of all 45 ADB developing member countries compared to 32 in the 2009 report; and the use of 2015 prices versus 2008 prices

‡ Due to the lack of comprehensive and relevant data across countries, ADB focused on 25 developing member countries (DMCs) with adequate data to get an estimate of Asia-Pacific infrastructure investment spending in 2015. These 25 DMCs account for 96 percent of the region's population

Based on Marsh & McLennan Companies' Asia-Pacific Risk Center's (APRC) analysis, six of the 24 DMCs (excluding the People's Republic of China) accounted for more than 85 percent of the infrastructure spend in 2015, and are likely to account for over three-quarter of the investment needed from 2016-2020. These countries are India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.§

Although the combined net assets of these six countries' listed banks totaled $300 billion, it barely covers a fifth (20.8 percent) of the estimated shortfall in infrastructure investment in developing Asia (see Exhibit 12). These countries will have to break away from the traditional dependence on just public and bank financing to stand a chance in securing their projected investment needs. As such, funding from other private capital sources are necessary. To achieve this, regulatory and institutional reforms are crucial to ensure economic viability and attractiveness of PPP proposals, which would then enhance private sector participation and strengthen institutional capacity.

On the investment side, Preqin reports that the largest 100 Asian institutional investors' asset allocation to infrastructure only constitutes $65 billion – or 0.3 percent of their total assets under management (AuM) of $20 trillion.[10] This amount is insufficient to even provide for 5 percent of the estimated infrastructure investment gap in developing Asia from 2016-2020.

However, private capital markets can be potential funding sources for infrastructure investments. An asset allocation shift of just 1-2 percent of their AuM from other asset classes into infrastructure, spread over five years, would already imply an average annual flow of between $40 to $80 billion – a substantial addition to infrastructure financing.

§ APRC analysis by using 2015 GDP as a proxy for breakdown of individual estimated current investment (2015)

EXHIBIT 12: BANKS' NET ASSETS INSUFFICIENT IN MEETING ASIA'S INFRASTRUCTURE INVESTMENT AND GAP

$ TRILLIONS, 2016-2020

Estimated Future Infrastructure Investment Needs in Developing Asia (excluding PRC)

Estimated Infrastructure Investment Gap in Developing Asia (excluding PRC)

Total Net Assets of all listed banks of the key countries*1

*1 Countries include India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam
Source: APRC analysis of data from Asian Development Bank and Capital IQ

Increasingly new participants with larger risk appetites are playing larger roles in bridging the gap between "bankability" and "economic viability" e.g. energy traders and the range of pre-finance solutions they offer in exchange for access to infrastructure deficient markets.
Abhimanyu Bhuchar, Partner, Oliver Wyman

EXHIBIT 13: SIZE OF LOCAL CURRENCY BOND MARKETS (PERCENTAGE OF GDP)

	2000			2015		
	GOVERNMENT	CORPORATE	TOTAL	GOVERNMENT	CORPORATE	TOTAL
PEOPLE'S REPUBLIC OF CHINA	16.41	0.29	16.70	38.52	20.54	59.06
HONG KONG, CHINA	8.12	27.16	35.28	38.68	28.73	67.41
INDIA	28.57	6.16	34.74	40.70	14.09	54.79
INDONESIA	35.39	1.36	36.75	13.00	2.16	15.16
REPUBLIC OF KOREA	24.37	46.32	70.69	52.74	76.90	129.64
MALAYSIA	38.04	35.21	73.25	52.86	43.84	96.70
PHILIPPINES	29.09	0.21	29.30	29.65	6.12	35.77
SINGAPORE	26.17	20.58	46.75	45.52	32.22	77.74
THAILAND	22.16	4.42	26.58	55.38	18.60	73.98
VIETNAM	0.30	-	0.30	21.53	0.79	22.32
TOTAL	**56.03**	**19.34**	**75.36**	**71.26**	**21.98**	**93.25**

Source: Asian Development Bank

An International Monetary Fund (IMF) report shows local currency debt for emerging markets has increased from $10.5 trillion in 2010 to $15 trillion in 2015, consistently making up 85-90 percent of total debt for emerging markets.[22] A deep and liquid local currency bond market can play an important role in long term financing, especially with long term foreign currency exposure a key concern in emerging markets.

Further capital market deepening would help alleviate potential refinancing risks and reduce foreign currency exchange exposures, although established European and North American institutional investors typically have some degree of aversion to non-G8 currencies.

However, the maturity of local currency bond markets in Asia varies. Exhibit 13 shows that although most local currency bond markets in the region grew between 2000 and 2015, countries like Vietnam started from a low base while the market in Indonesia would appear to have regressed significantly.

The further development of local currency bond markets would significantly reduce the financing gap. However, non-bank institutional capital will continue to be crucial in supporting infrastructure financing, particularly in complex projects requiring either non-fixed income funding sources or where funding in dual currencies are required (reducing revenue versus financing currency mismatch). Partnering with these institutional investors will continue to be important for local deal sponsors and governments.

THE HUNT FOR BANKABLE INFRASTRUCTURE PROJECTS

A combination of public reform and deepening private capital pools could result in a larger infrastructure financing capital base. A key challenge in realizing this outcome is ensuring a steady and sizable pipeline of bankable projects.

Using a database of deals from the past decade, APRC segmented these deals by investor preferences (tenor, currency, sector, location, etc.) and achieved the following "bankability" split. Exhibit 14 shows that three-fifths of emerging markets infrastructure projects in Asia are not bankable without government or MDB (or similar institutions') involvement.

To create a bankable supply of projects, it is vital for respective country authorities to take on a more active role, putting in place measures and reforms which support a greater flow of bankable domestic infrastructure projects.

The next section of this report presents a set of guidelines to help improve infrastructure project bankability in Asia. These guidelines reflect an ideal environment for bankable projects and consist of a series of enabling levers which would support an increase in the number of such projects. The remaining sections of this report highlight how these guidelines apply in the largest infrastructure sectors by spend and in key growth countries for infrastructure investment within the region.

EXHIBIT 14: APRC'S ANALYSIS OF PROJECT BANKABILITY IN EMERGING MARKETS

1 BANKABLE – HIGH QUALITY (5-10%)
Largely denominated in foreign currencies, stable industries, reputable projects, longer time horizon. Attracts broadest group of investors, including many foreign and international institutional investors (but many of these have country rating exclusions, thus focus on "least emerging" countries)

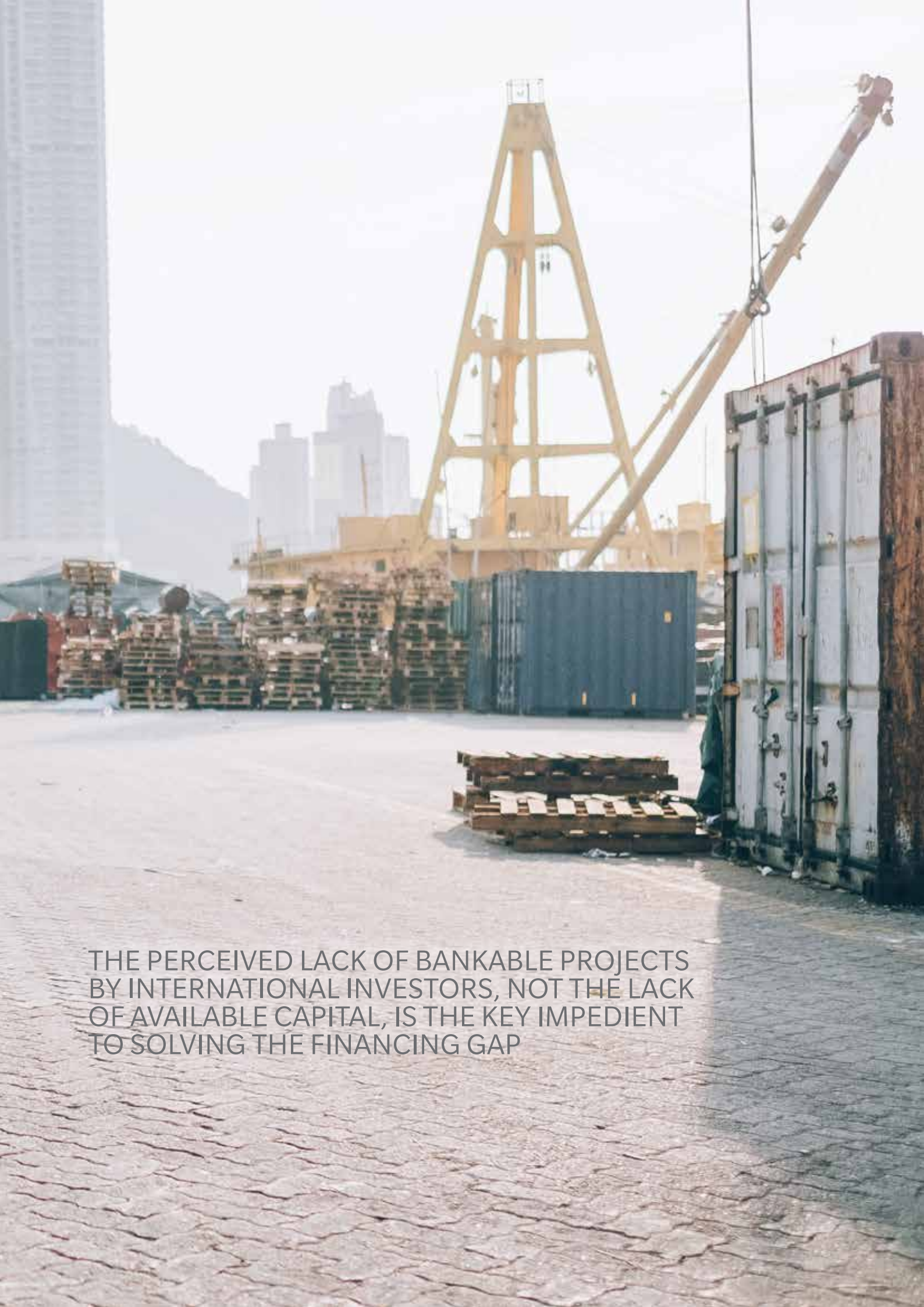
2 BANKABLE – MEDIUM QUALITY (10-15%)
Increasing quality of projects with more foreign currency (G8) denomination (e.g. US$/€/AU$), more stable industries, emerging rather than frontier markets, better individual project characteristics (e.g. stable cash-flow). Investors are still largely commercial banks, and other domestic or higher risk appetite investors

3 BANKABLE – LOW QUALITY (15-20%)
Projects where private sector funding is feasible, but with high risks. Revenues accrued are in domestic currency. Typically in "exotic" frontier markets with low political stability, high FX risks, volatile infrastructure industries. Investors include domestic capital, high-risk investors (e.g. credit funds with emerging market focus) and commercial banks

4 NOT BANKABLE PROJECTS (55-65%)
Projects which are not economic (i.e. cost of building and operating is less than that of the amount of tariffs received) require the government or MDBs' involvement either in the form of financing the overall project or as an anchor investor, resulting in them taking more risks

Source: APRC proprietary model and methodology; Bankable split estimated based on detailed modeling of infrastructure project flow and banks' balance sheet assessment; "not bankable" share estimated based on triangulation of non-private funding sources

DRIVING PROJECT BANKABILITY



THE PERCEIVED LACK OF BANKABLE PROJECTS BY INTERNATIONAL INVESTORS, NOT THE LACK OF AVAILABLE CAPITAL, IS THE KEY IMPEDIENT TO SOLVING THE FINANCING GAP

IMPROVING INFRASTRUCTURE PROJECT BANKABILITY

EXHIBIT 15: APRC'S INFRASTRUCTURE PROJECT BANKABILITY GUIDELINES

Source: APRC analysis

Across much of Asia, there is an insufficient pipeline of infrastructure projects that meet the bankability requirements of international investors. This issue is a key driver of the infrastructure financing gap in the region and needs to be resolved for a meaningful level of international private sector investment to be channeled towards Asia.

Consistent adherence to the set of bankability guidelines outlined in this report, coupled with the deepening of national capital markets, could markedly change the outlook for infrastructure investment in the region by creating a pipeline of bankable projects. By highlighting the key levers to support the efficient financing and construction of a project in emerging Asia, this set of guidelines is useful to investors, governments, regulators and developers alike.

The burden of responsibility to effect change sits with national governments across Asia. While many countries have begun making changes in line with international best practices, neither the volume nor the pace of change has been enough yet. Institutional investors must also change, but are well placed to do so at a faster rate than governments. They must focus on developing a deeper knowledge base of the respective host countries, else regulatory developments at the provincial levels may render a seemingly viable project at one location unbankable in another.

This section includes two case studies – Central Java IPP (Indonesia) and the Bangkok Skytrain (Thailand) – highlighting how some of these levers can be applied. Further applications of these levers are presented in subsequent sector- and country-level analyses.

1. PROPER DOCUMENTATION AND DEAL STRUCTURE

Successful infrastructure projects typically have a well-defined timeline and process, as well as an accompanying set of documentation and permits required – where preparation and application of permits are well built into the process.

Experienced financiers and contractors typically also structure the project phases and timelines in a way that minimizes additional costs or risks – for example, disbursements of financing in tranches, only upon completion of certain milestones, as well as requiring explicit legal owners (usually some municipality) for construction and maintenance of "last mile" infrastructure or concessions to mitigate specific project risks (such as base or availability payments to account for demand risk).

As such, a key instrument to ensure appropriate project structure and terms would be via the documentation or proof of preparation. These typically include:

- Rigorous project governance structures, proof of technical capability (from governance structures with clear roles and responsibilities to securing sufficient preparation funding, and minimizing costs through standardization)
- Permits for land, construction, discharge, and other regulatory requirements
- Economic feasibility and financial viability studies, environment assessment studies (for example, conducting robust demand forecasting)
- Technology viability assessments to determine if technology is proven
- Risk identification, allocation, and transfer (with incentives, risk mitigations, and use of insurance)[23]
- Other documents as required, including availability of financing, offtake agreements (if separately required)

This process can become convoluted given the number of stakeholders involved. Additionally, inconsistent approvals and the revoking of permits in some emerging markets can deter investors, leading them to build in a higher hurdle rates or longer project timelines which in turn reduce project bankability.

POTENTIAL APPROVAL AND PREPARATION PROCESS ENHANCEMENTS

Some governments, as part of legislative reform, are trying to simplify and expedite the project approval and preparation process. Efforts include:

- Ensuring efficient and transparent procurement services which are foreign investor "friendly"
- Creating centralized PPP liaison centers which work with private entities to support or facilitate the project preparation process. This includes simplifying the number of permits or municipals involved and helps ensure necessary project land is pre-acquired
- Creating a new project oversight committee, that can intervene if the application or negotiation takes too much time
- Provision of a standardized checklist of documents in their requests for proposals, similar to the sector-specific checklists provided for World Bank's Public-Private Partnership in Infrastructure Resource Center (PPPIRC)[24]

There has been significant progress in Thailand and Indonesia on these fronts. Both have started to streamline the entire deal preparation process, learning from past experiences where land acquisition and funding issues resulted in prolonged project delays. Examples include the Batang Java Central power plants, and the Thailand-China highspeed 873 km railway project.

2. APPROPRIATE COVENANTS AND FUNDING STRUCTURE

Covenants refer to specific clauses in contract agreements between two or more parties and are set in place to protect the interests of various stakeholders. The clauses, usually both financial and non financial, typically refer to both the offtake agreement as well as the lending agreement between a SPV and the bank.

Some common financial covenants include: minimum debt service coverage ratio (DSCR) requirements; interest coverage ratios; and prepayment options. Non-financial covenants (positive and negative) protect parties against events like construction delays, cost overruns, or extraordinary instances such as the revocation of licenses or permits.

THE IMPORTANCE OF COVENANTS

Covenants are key contractual terms set down by various stakeholders, to ensure their interests are met over the lifetime of the project. Financial covenants impose certain financial obligations on the SPV. For example, the borrower could be required to maintain the minimum level of DSCR as stated in the covenant to mitigate credit risk to the debt holders.

Non-financial covenants can either be positive or negative. Positive covenants, also known as affirmative covenants, are obligations the borrowers adhere to in the interests of the debt holders (for example, the obligation to keep required risk insurance in force). In contrast, negative covenants, also known as restrictive covenants, are obligations for the borrowers to refrain from performing certain actions (for example, the obligation for the SPV to not undertake any other activity except for building and operating the project).

Other key covenants are step-in rights (or embedded options) which allow for unique state-dependent control rights to protect the interest of stakeholders.

DECIDING ON THE RIGHT COVENANT LEVELS AND FUNDING STRUCTURES

There have been instances of project failures due to cash flow and liquidity challenges, largely driven by slow ramp-up of demand or traffic flow. Examples include the pre-IPO greenfield construction of the BTS Sky Train project in Thailand, as well as the Brisbane Airport Link.

In instances where there are no minimum revenue guarantees or availability payouts, financing repayment should be structured to allow for flexibility in the payment amortization schedule (or even use of deferred interest or Payment in Kind structures), while additional financial headroom should be allowed for if the private player takes on significant volume risks, with the government entity also potentially undertaking a “first loss” guarantee on behalf of the SPV.

In other sectors, where there could be a single offtake agreement, the financiers should also expect the project entity to take on some form of non-payment insurance which is covered next in “presence of legal and economic recourse”.

3. PRESENCE OF LEGAL AND ECONOMIC RECOURSE

The construction of large scale projects is often met with delays, disruptions or even cancellations. As such, all stakeholders in an infrastructure deal will both put in place appropriate risk mitigants as well as further escalation (terms of settlement, litigation) procedures. In such instances, players will first seek economic settlement (out of court, through insurance or contractual claims), before escalating to forms of legal recourse.

For economic recourse, there are insurance and other risk mitigation options offered by export credit agencies (ECAs) or multilateral development banks (MDBs) that provide investors with confidence and mitigate their exposure to risks. For example, ECAs can provide cover for investors by means of insurance or of a direct guarantee for political risks, commercial risks, or both. With their involvement, the infrastructure projects become more bankable and commercial lenders would be less averse to financing these projects.[25]

Private investors who do not have access to ECAs or MDBs can turn to other entities for such economic recourse. An example would include clients who have sought Marsh's expertise for non-payment insurance for project finance lenders. Using the example of non-payment insurance, this policy does not only mitigate risk, but also has other advantages including reduced borrower credit risk, country exposure relief assistance, and regulator capital relief.

A key requirement for appropriate legal recourse preferred by emerging market financiers is sovereign immunity or named centers of arbitration. This is because it is likely that the awarding authority in an infrastructure project will be a government authority and could consequently benefit from sovereign immunity. This immunity is a legal doctrine according to which the sovereign or state cannot commit a legal wrong and is immune from civil proceedings or criminal prosecution.

This way, the government is able to provide credible guarantee support to PPPs which would demonstrate to investors that there is a high quality of project preparation, including financial and structuring parameters. In the event that there is a guarantee call, there will be a claim assessment and the associated guarantee payments will be made to the recipient of these guarantees. For example, in Indonesia there are two other types of government guarantees applicable to power plant projects in addition to the Public Service Obligation (PSO). These guarantees are the Guarantee Agreement issued by the Indonesian Infrastructure Guarantee Fund (IIGF) and the Business Viability Guarantee Letter (BVGL) issued by the Ministry of Finance (MoF).[26]

4. THOROUGH DUE DILIGENCE

Due diligence is a key aspect of infrastructure project deals. The complexity of project finance (both in terms of technical capability and financial structures), the magnitude of the financial investment, the scale of construction effort and the number of stakeholders involved, means that most projects have multiple teams addressing various feasibility considerations.

Prior to the launch of any infrastructure projects, feasibility studies should be conducted to assess the technical and commercial viability of the project, typically conducted by a mix of engineering, legal, and finance teams. This is important given the complexity and magnitude of the financial and technical outlay involved. In developed markets, third-party companies with specialized expertise are typically contracted by the project entity to provide the due diligence required.

We need to understand why people go through the hassle of doing due diligence, pricing deals, creating covenants and negotiating rights of ways. This is because they need to quantify risk, manage their capital, and ensure efficiency. They are looking for ways to expand the velocity of capital in this sector.
Eric Pascal, Partner, Oliver Wyman

These services can typically be broken down into a number of categories:

- Environmental impact and technical assessments
- Financial assessments – which could involve financing structures, deal structures, sufficiency of risk mitigants (insurance, hedging contracts, etc.)
- Commercial aspects such as demand or revenue forecasting, ROI optimization, the political and regulatory outlook, competitor scans and pricing levels
- Legal clauses, for example, concessions, availability of financing, offtake agreements, risk mitigants

Projects in emerging markets are increasingly encouraged along this developmental path, in a bid to improve both the project success rate as well as project bankability. The Asia-Pacific Project Preparation Facility provides due diligence for projects. It encourages private sector participation in infrastructure by adopting a more consistent and higher-quality approach to PPP project preparation development and transaction advice across the region.[27] In addition, it creates and oversees data rooms and other channels for dissemination of project information for investor due diligence.

5. WELL-STRUCTURED CONCESSION RIGHTS

A concession granted to the winning project bidder gives the SPV long-term rights to use public assets (land, operating licenses, etc), in return for the SPV being contractually responsible for the full delivery of services. Services can include the operation and maintenance of the assets, and also for financing and managing all of the required investment.

Concessions for usage or operation of assets are also typically coupled with offtake mechanisms. In this case, the concessionaire obtains most of its revenues directly from its users through tariff levels established by the authority in the offtake contract. These can include payment schedules, changes in payment schedules over time as well as events to trigger a review of the payment schedule.

Relying on the "invisible hand of the free market", it is then the prerogative of the concessionaire to achieve improved levels of efficiency and effectiveness since any gains in efficiency translate into increased profits and returns to the concessionaire; although regulators may set additional key requirements such as maintenance and renewal or replacement of assets.

Additional concessions may be given (or adjusted) where the deal economics may be potentially challenging, for example if the aggregate amount of tariffs collected by the concessionaire is not sufficient to cover the cost of operation of the assets (or even maintenance or further investment). In capital-intensive projects where there is a high initial capital outlay, for instance, there has to be some degree of revenue recovery or minimum guarantees (such as availability payments or exemption of operating license fees) to ensure the project company can sufficiently meet interest and debt repayments.

USING CONCESSION RIGHTS EFFECTIVELY

Concessions, if well-structured, can boost project bankability and ensure private finance participation, while protecting the interests of the general public. For example, non-compete concessions or assurances are typically demanded for volume-dependent infrastructure such as toll roads. These can include the prohibition of new entrants into the market, which could adversely affect project economics.

6. ROBUST RIGHTS TO PAYMENT

The right to payment is the mechanism governments use to determine payments to investors. It is used to provide an incentive for the operator to meet the availability and performance standards set out by the public authority and also match payments to the outcomes and outputs that the authority wishes to deliver.

DEVELOPING ROBUST PAYMENT MECHANISMS

The authority should structure the payment mechanism in a way that is not only realistic and fair in supporting the long-term partnership, but also objective, transparent, and easy to operate. To make it more robust, the public agency should seek feedback from the operators prior to developing the payment mechanism. The payment mechanism should not only incentivize the operators to deliver the service at the required standards, but also include penalties to deter the operators from providing sub-standard performance, or none at all. Depending on the nature of the projects, the payments may vary with these elements: availability of service, performance quality of service, and the usage of service.

For example, a Power Purchase Agreement (PPA), signed between the purchaser (often a state-owned electricity utility) and a privately-owned power producer, secures the payment stream for a concession project for an independent power plant (IPP). In this instance, the private producer agrees to make available to the purchaser the contracted capacity of energy and deliver the energy in accordance with the PPA. The PPA may provide sanctions or require the power producer to pay liquidated damages if it fails to deliver the power as promised.[28]

In a separate example, Japan's Ministry of Economy, Trade and Industry (METI) introduced expanded curtailment rules which extended the period of time which the nation's utilities were allowed to refuse to accept electricity from developers, to regulate the supply of renewables in 2015. This introduction corrected the nation's generous feed-in-tariff (FiT) program launched in July 2012 that saw 82 GW worth of FiT approved projects (as of July 2015) in queue – resulting in extremely high costs to the nation and energy output far exceeding grid capacity.

ENSURING APPROPRIATE RISK TRANSFER

Defining who the legal payees are is important for any capital-intensive project where revenues are required to cover capital outlay as well as operations and maintenance spending. For utilities, offtake payments are common, with further guarantees required if the payor is deemed to have a high risk of delayed or missed payments. In addition, there are also increasingly more well-structured payments rights – fixed or variable charges and payment pegged to raw material cost. These payment rights may include the renegotiation of tariffs at stipulated time periods. For non-utilities such as rail and toll roads, it is even more crucial to clearly define payors and sources of income as this is crucial for understanding project economics and therefore attracting investors.

CASE STUDY 1

CENTRAL JAVA IPP: TOP PRIORITY PROJECT IN A BID TO ADDRESS RISING ELECTRICITY DEMAND

Also known as the Batang Power Station, the 2 GW coal-powered electricity generation plant is the first project to be delivered under Indonesia's PPP regime and is estimated to cost about $4.3 billion. On completion, it will be one of Asia's largest Independent Power Producers (IPPs).[29]

The project is co-owned by PT Bhimasena Power Indonesia (BPI), a consortium consisting of J-Power, Itochu Corporation, and Adaro Energy, to build-own-operate-transfer (BOOT) the new facility that will utilize ultra-supercritical pressure technology to improve access to electricity for 7.5 million people; in line with the Indonesian government's vision to expand power generation and increase transmission capacity.[30]

The IPP is to deliver electricity to Indonesia's government-owned power company, PT PLN (Persero), for 25 years pursuant to a Power Purchase Agreement (PPA) and transfer the facility to PT PLN thereafter to run for the remainder of the power plant's useful life. International Finance Corporation (IFC), a member of the World Bank Group and advisor to PT PLN on this project, was the neutral broker that recommended this transaction structure and subsequently proposed a risk allocation structure in the PPA to maximize bankability of the IPP while minimizing the risks to PT PLN.[30] At one point a risk allocation mismatch between the Engineering, Procurement, and Construction (EPC) contract and the Power Purchase Agreement (PPA) threatened to derail the project, but this was ultimately resolved through risk transfer (insurance).

PROVISION OF COVENANTS AND APPROPRIATE FUNDING STRUCTURE

The total co-financing amount is approximately $3.4 billion, with export credit agency, Japan Bank for International Cooperation (JBIC), committing to lend $2 billion, and the remaining loan amount divided between nine other banks.[29] According to Milbank, one of the advisers to the deal, JBIC has supplied a political risk guarantee for the debt portion by senior commercial lenders.[31]

Further, IFC has stated that the Indonesia Infrastructure Guarantee Fund (IIGF) and the government, acting through the Ministry of Finance, have provided a guarantee to the project to cover for payment defaults and termination payments under required buyout scenarios. All of these were being executed through a single guarantee agreement with recourse agreements to provide for reimbursement by PT PLN for claims made under the guarantee.[30] Although the guarantee is only $33 million (less than a percent of the estimated total project cost), IIGF's involvement in the project provides for useful close scrutiny to the process, and this in turn improves the project's overall bankability.[32]

PROJECT ENABLED BY PASSING OF NEW LAND ACQUISITION LAW

The Central Java IPP project initially faced many delays due to land acquisition issues and protests by local people against the construction of the power plant.[33] However, the project was revived when the government fast-tracked the land acquisition process. The Land Acquisition Act passed in February 2015 (an amendment to the 2012 law) illustrated the government's conviction in clearing roadblocks for the completion of infrastructure projects.[34] The main impetus of such a measure is to improve the attractiveness of infrastructure projects to the private sector, and to encourage their participation and investment in these projects to accelerate infrastructure development that is vital for the country.

CASE STUDY 2

BANGKOK'S SKYTRAIN (BTS): BACK ON TRACK DESPITE EARLY STRUGGLES

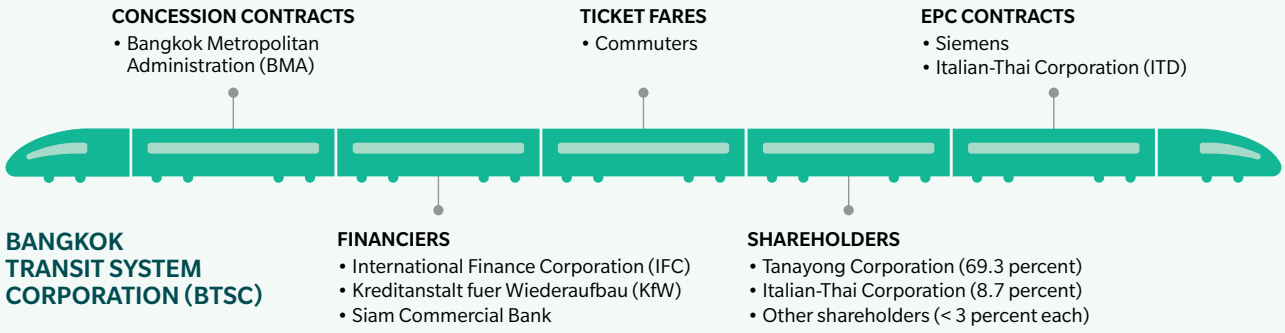
Commonly known as the BTS, Bangkok's Skytrain initially only covered 23.5 km of track in the center of Bangkok and has since expanded to a combined route length of about 39 km consisting of 36 stations along two lines: Sukhumvit and Silom. The BTS opened in 1999 and is the only rail infrastructure project out of seven projects in the Seventh Plan Urban and Regional Transport (SPURT) established in 1991. Back then, SPURT considered the use of private concessions to develop urban transport infrastructure to alleviate the chronic congestion problems (and air pollution) that densely populated Bangkok faced. There were four different government agencies leading various concessions with total projects valued at nearly $8 billion.[35]

Tanayong Corporation, a Thai real estate company, won the bid for this project and subsequently created a project company, the Bangkok Mass Transit System Public Company Limited (BTSC). The financing package was approximately $1.4 billion and was financed solely by the private sector – $650 million in equity with the remaining in debt that came largely from International Finance Corporation (IFC), Kreditanstalt fuer Wiederaufbau (KfW, a European development bank), and Thai banks (Siam Commercial Bank led the transaction). The long-term debt for the project was agreed in 1997 with a debt service coverage ratio that reflected the ridership forecast of 650,000 riders per day for the project – it was estimated that BTSC would recover its costs within the first 10 years with a 16 percent rate of return given the contract provisions.[36]

Contract provisions[36,37]:

- Full concession: a Build-Operate-Transfer (BOT) scheme with a 30-year concession agreement; any extension request must be made three years before the concession expiry date
- The project company, BTSC, receives all advertising revenue and revenues from right-of- way (on a distance-based tariff regime) with no funds provided by the government for operating the transit system. The government was responsible for providing the right-of-way and assisting in the relocation of utilities along the route during construction
- Fares were based on a formula incorporating the domestic Consumer Price Index (CPI), exchange rate fluctuations and variations in US interest rates – and translated to a 7 percent increase in fares for a 5 percent increase in inflation
- The concession agreement contained the fixed price, specified delivery date, performance standards, and required the main private sector partner to maintain at least a 51 percent stake in BTSC
- Other provisions included were: dispute resolution through arbitration; full-fare renegotiation due to various events (for example, force majeure, macroeconomic shocks)

EXHIBIT 16: BANGKOK SKYTRAIN (BTS) PROJECT STRUCTURE



Source: APRC analysis, United Nations

MORE THOROUGH DUE DILIGENCE COULD HAVE FURTHER OPTIMIZED RIDERSHIP FORECAST

Despite the contract provisions, there were a couple of major issues that negatively affected the project at the onset. The most significant problem BTS faced was the inaccurate ridership forecast. When BTS began operations in December 1999, the actual ridership was not even a third of the forecasted 650,000; by 2007, ridership had only increased to 380,000 riders per day (58 percent of the projection).[36] This inaccurate forecast led to several major financial problems for the BTS and almost resulted in the collapse of BTSC.

This was the result of having only one of the private companies involved in BTSC projecting the ridership forecast. Impartial due diligence could have been put in place to allow for better financial assessment of the project, especially for the forecasting of ridership as many aspects of the project were reliant on this forecast. For example, BTSC is to recoup its costs from the revenue generated through the operations of the BTS, and this revenue forecast was based on the projected ridership numbers. Also, the entire debt structure was designed based on the ridership forecast.[36]

AN ALTERNATIVE FUNDING STRUCTURE MAY HAVE HELPED BUFFER AGAINST FINANCIAL SHOCKS

In addition, the 1997 Asian Financial Crisis severely damaged the project. The exchange rate, which stood at 25 Baht per US dollar at the time of contract signing, had increased to 40 Baht per US dollar in 2000, reflecting a 60 percent depreciation of the Baht.[36] Consequently, the BTSC liabilities had increased by 60 percent. This devaluation of the Baht, coupled with the inaccurate ridership forecast, resulted in an inadequate debt service coverage ratio (DSCR) for the project.

There are a number of strategies to manage currency risk and BTSC could have mitigated this asset-liability currency mismatch had there been some financial instruments put in place. For example, hedging arrangements could have been set up to allow the project company to benefit from project security, although in exchange for an increase in the cost of debt.

Due to these prevalent problems, BTSC eventually defaulted on its principal payments in 2002 and went into discussions with creditors over its debt restructuring plans, followed by a business rehabilitation filing with the bankruptcy court in 2006. However, BTSC was released from business rehabilitation in October 2008 after completing the rehabilitation plan approved by the court. Within half a year, the company made its first profit in March 2009.[37]

KEY SECTORS IN THE REGION

INVESTMENT IN THE ELECTRICITY AND POWER SECTOR IS EXPECTED TO HAVE GROWN BY ALMOST HALF A TRILLION DOLLARS BY 2020

As shown in Exhibit 17, infrastructure spend in Asia-Pacific is expected to reach $2.5 trillion in 2020, more than double the amount from just a decade before. While the electricity and power sector has grown at a strong compounded annual growth rate (CAGR) of 9 percent, all the other sectors are estimated to command a respectable CAGR of 7 to 8 percent as well.

This growth has been supported in part by the development of an increasingly infrastructure friendly environment in many Asian countries. Investment across all sectors has benefited from measures that maintained macroeconomic and political stability; improved legal and regulatory frameworks; increased transparency; and strengthened investor protection.

While the list of key success levers improves infrastructure project bankability across sectors in general, it is essential to note that there are some differences unique to the sectors in which these projects fall in.

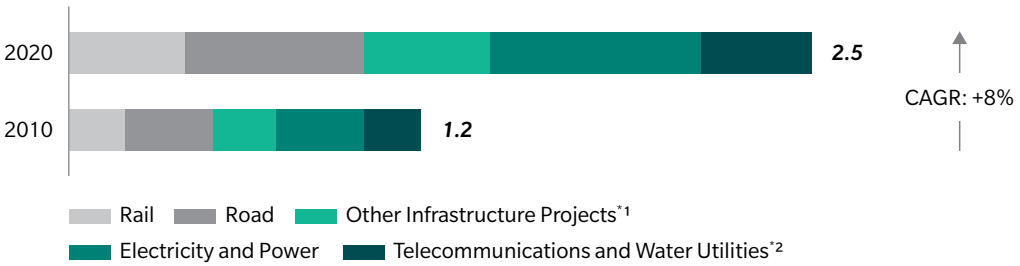
For example, power purchase agreements (PPAs) are used in electricity and power Public-Private Partnership (PPP) projects in order to secure payment streams for Build-Own-Transfer (BOT) or concession projects for independent power producers (IPPs). Such guarantees provide for certainty in both the pricing and quantity of power being purchased necessary to make the project viable.[28] An additional benefit to a PPA is that the purchaser is able to secure its supply of power. For example, Indonesia's state-owned power company, PT PLN (Persero) has a good track record of successfully financed IPPs and an established form of PPA.[38]

Additionally, governments regularly seek new ways to fund the development of road networks without having to commit too much of their fiscal spending. Consequently, project finance or PPP road projects are increasingly common. However, a key issue for these road projects is the construction of an appropriate payment mechanism. For example, Australia is home to a number of road projects that failed financially early on in their contract terms due to over-optimistic traffic projections at the time of the bids.[39]

This section outlines the core characteristics and significant risk mitigants of Asia's key infrastructure sectors.

EXHIBIT 17: ASIA-PACIFIC INFRASTRUCTURE SPEND – SECTOR BREAKDOWN

$ TRILLIONS, 2010-2020



*1 Includes airports, dams, ports, land control systems, and inland waterway infrastructure
*2 Includes telecommunications, sewage infrastructure, and water infrastructure
Source: APRC analysis of data from Construction Intelligence Center

ELECTRICITY AND POWER

As emerging markets grow and rapidly industrialize, public authorities need to ensure their power infrastructure can reliably meet the needs of manufacturing-centric growth – allowing for optimized levels of production that are free of costly power outages. However, the rising electricity demand that accompanied this industrialization has not been met with consistent supply, leading to frequent electricity outages in some countries including Vietnam and Myanmar.

GOVERNMENT POLICY SETS THE NATIONAL INDUSTRY DIRECTION

Governments are increasingly focused on ensuring an uninterrupted power supply by implementing market-friendly reforms to encourage IPPs to play a more important role in meeting rising power demands. For example, Indonesia's three-stage Fast-Track Programme (FTP) is building new transmission links between Indonesia's isolated grids and adding 35 GW of new capacity of power by 2019 – with 44 percent ($36 billion) of investment being offered to private sectors.[40] Government reforms include clarifying regulations for PPPs; improving land acquisition and environmental permit processes; implementing a system of auctions and feed-in tariffs (FiT); and concessions of offtake agreements at indexed tariffs. This way, key risks, such as those linked to raw material prices, operator performance, and tariff re-negotiation, are largely mitigated or transferred to the government.

HEADING TOWARDS A GREEN FUTURE?

Many governments are driving a renewable energy agenda due to cost and emissions advantages and international pressure stemming from the Paris Agreement's Intended Nationally Determined Contributions (INDCs).[#] These imperatives include enhancing energy security, reducing the need for imported fuels, conserving a nation's natural resources, and cutting down on carbon emissions. A number of Asian Governments have introduced incentives (e.g. tax incentives, FiT, energy production payments) to support growth in this area and to encourage more investment.

Examples of proactive government action include the Vietnamese government approving a renewable energy development plan to increase electricity production by renewables from 3.5 percent in 2010 to 5 percent by 2020 and 11 percent by 2050 after ratifying the Paris agreement.[41] Additionally the Thai government, in its new power development plan (PDP) 2015-36, aims to reduce its dependence on gas-powered generation from around 70 percent to 40 percent by 2036, with a shift towards renewable sources.[42]

When the economics of a project or investment is influenced significantly by FiT guarantees, extra consideration should be extended prior to investment. In the Philippines a recent FiT across a number of clean energy sources was only guaranteed up to a set capacity. This meant that a number of projects which became operational after the capacity had been reached were no longer able to access the FiT rates upon which investment decisions had been based.[43]

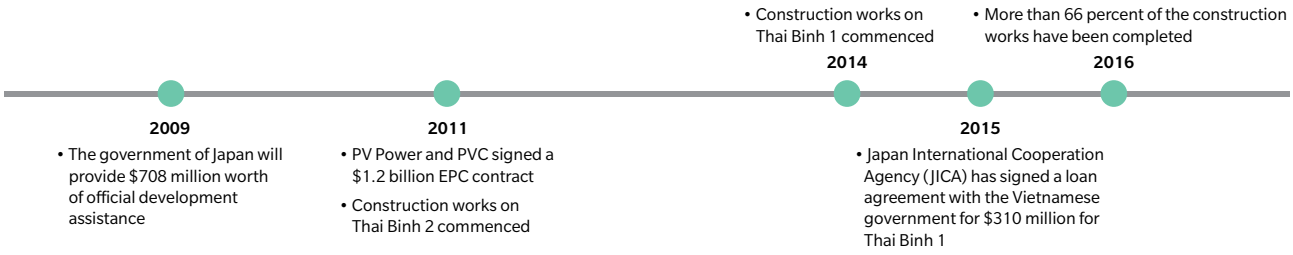
The Paris Agreement deal is the world's first comprehensive climate agreement where all countries agree to work to limit global temperature rise to well below 2 degree Celsius, with efforts to limit the increase to 1.5 degree Celsius

EXHIBIT 18: EXAMPLES OF ELECTRICITY AND POWER PROJECTS

THAI BINH THERMAL POWER CENTER 1,800 MW *(VIETNAM)*

PROJECT DETAILS:
Project involves the the construction of a 1,800 MW thermal power complex in Thai Binh which will comprise of two power plants: Thai Binh 1 (600 MW) and Thai Binh 2 (1,200 MW). Construction works began in 2011 and are expected to be completed by end 2017

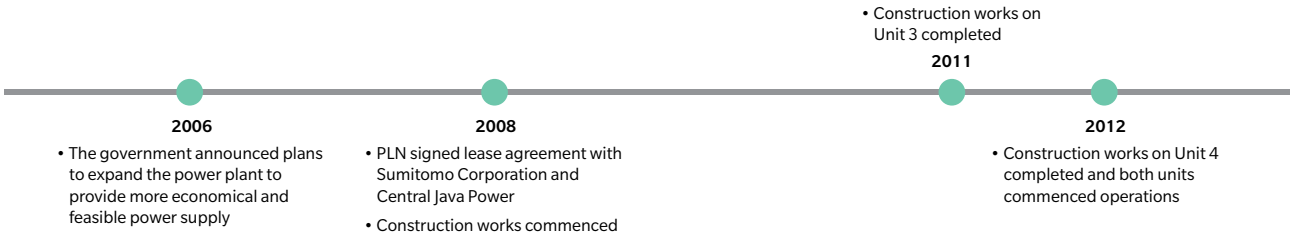
PROJECT STAGE: Execution
PROJECT VALUE: $3.07 billion
PROJECT OWNER: PetroVietnam Power Corporation (PV Power); Vietnam Electricity (EVN)
PLANNING AUTHORITY: Ministry of Industry and Trade, Vietnam
EPC CONTRACTOR: Marubeni Corporation; Petrovietnam Construction Joint Stock Corporation (PVC)



TANJUNG JATI B COAL-FIRED POWER PLANT EXPANSION – CENTRAL JAVA *(INDONESIA)*

PROJECT DETAILS:
Project involves the expansion of an existing coal-fired power plant by adding two power generations with capacity of 660 MW each. Construction works began in 2008 and were completed by 2012

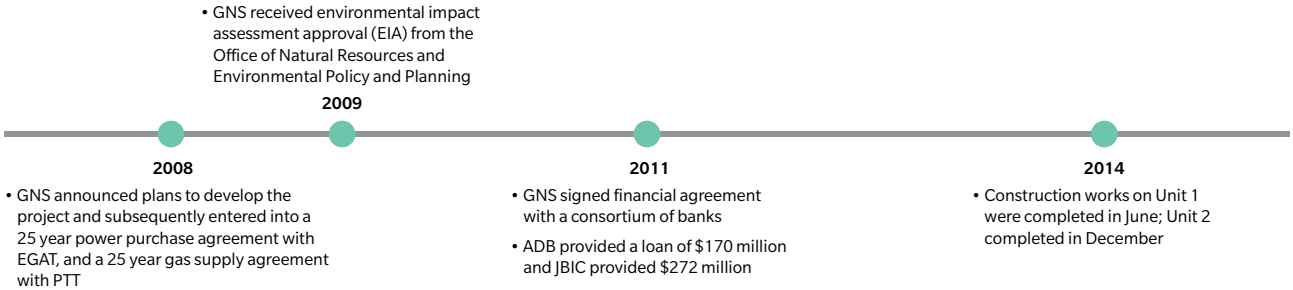
PROJECT STAGE: Construction completed
PROJECT VALUE: $2.60 billion
PROJECT OWNER: PT. Central Java Power (Sumitomo Corporation)
PLANNING AUTHORITY: Ministry of Energy and Mineral Resources, Indonesia
EPC CONTRACTOR: Sumitomo Corp., Wasa Mitra Engineering



NONG SAENG GAS FIRED POWER PLANT 1,600 MW – SARABURI *(THAILAND)*

PROJECT DETAILS:
Project involves the construction of a 1,600 MW natural gas-fired combined cycle power plant, comprising of two units with 800 MW each. Construction works on Unit 1 were completed in June; and on Unit 2 completed in December

PROJECT STAGE: Construction completed
PROJECT VALUE: $1.19 billion
PROJECT OWNER: Gulf JP NS Company, Limited
PLANNING AUTHORITY: Ministry of Energy, Thailand
EPC CONTRACTOR: Sino-Thai Engineering & Construction Public Company Limited



Source: APRC analysis of data from Construction Intelligence Center

LOGISTICS HUBS (AIRPORTS AND PORTS)

Both air and sea transport continue to play a vital role in Asia's geographically-fractured economic and social ecosystem. Countries that have invested heavily in trade infrastructure and opened their logistic hubs to foreign investors have since reaped the benefits of global trade.

For instance, both Indonesia and Thailand have disclosed their ambitions to strengthen sea trade infrastructure to tap on burgeoning shipping volumes accessing a congested Straits of Malacca. As for air travel, Thailand's main airport operator, Airports of Thailand, has announced plans for the expansion of six of its main airports due to their high utilization rates caused by a boom in passenger traffic. These expansions will cost over $5.5 billion and will eventually allow Thailand's airport network to serve 150 million passengers a year in 2030, up from 72 million passengers now.[44]

China, the world's second largest economy, is forecast to raise investment in its airport infrastructure construction beyond the level of the transportation sector over the coming five years. This is in line with investment intentions and strategy under the country's 13th Five Year Plan (2016-2020), with plans to build 74 new civil transport airports by 2020, bringing the total number to 260 by 2020. It is estimated that China's total annual flight hours will rise to 2 million hours by 2020.[45]

THE IMPORTANT ROLE OF RISK MITIGANTS

The construction of both airports and ports is capital intensive in nature, and successful roll-outs require adequate risk transfers to respective project owners and backers – including construction risks, traffic risks, revenue, operator performance risks.

In order to mitigate or transfer these risks to encourage investment in more projects, governments have developed various deal structures and concessions to improve project feasibility and attractiveness to investors. The financial close of the 25-year concession Mactan Cebu Airport project has boosted confidence in the market for future PPPs. ADB's provision of $75 million demonstrates its commitment, along with the Philippines government, in developing critical infrastructure for the country.[46]

Next door, Vietnam is also keen to address its port infrastructure deficit as it becomes increasingly important on the global stage, with more shipping companies choosing Vietnam as their port of call. It is estimated that about 820-1,080 million tonnes of cargo will transit through Vietnam's seaports until 2020.[47] The government of Ca Mau Province said that the local government would continue creating a transparent and favorable business investment environment for domestic and international investors doing business. As of December 2016, a major project awaiting investors is the $2.5 billion Hon Khoai seaport project, which has been approved in principle by the government in 2015.[48]

EXHIBIT 19: EXAMPLES OF LOGISTICS HUBS PROJECTS

PELINDO II – TANJUNG PRIOK PORT EXPANSION *(INDONESIA)*

PROJECT DETAILS:
Project involves the expansion of Tanjung Priok Port by construction of new terminals, and increasing port capacity from 5 million twenty-foot equivalent units (TEUs) to 18 million TEU. Project has been planned to be constructed in multiple phases with construction works beginning in 2013 and expected to be completed by 2023

PROJECT STAGE: Execution
PROJECT VALUE: $4.67 billion
PROJECT OWNER: PT Pelabuhan Indonesia II (Pelindo II)
PLANNING AUTHORITY: Tanjung Priok Port Authority
EPC CONTRACTOR: PT Pembangunan Perumahan (PT PP)

2009
- Pelindo II announced plans to undertake the project

2012
- In February, project received in-principle approval for construction; followed by final approval two months later
- PT PP won the construction contract for the first phase of the project

2013
- Ground breaking ceremony was held for the project and construction activities commenced

2015
- Pelindo II signed a concession agreement with MoT to hand over the role of regulator

2016
- Pelindo II started operations on its first terminal while construction activities are still underway for the other terminals

LACH HUYEN PORT DEVELOPMENT – HAI DUONG PROVINCE *(VIETNAM)*

PROJECT DETAILS:
Project involves the construction of an international port capable of handling container ships of up to 8,000 TEUs. Constructed in two parts, construction works commenced in 2013 and are expected to complete by 2018

PROJECT STAGE: Execution
PROJECT VALUE: $1.23 billion
PROJECT OWNER: Ministry of Transport, Vietnam (MoT)
PLANNING AUTHORITY: Ministry of Transport, Vietnam (MoT)
EPC CONTRACTOR: Penta-Ocean Construction Co Ltd and TOA Corporation

2008
- MoT announced plans to undertake the development of port under public-private partnership mode

2013
- Construction commenced on first part after ground breaking ceremony ($900 million) – funded by Japan's official development assistance (ODA) loans and Vietnam's state budget

2016
- Ground breaking ceremony on second part of construction held – a joint venture between Saigon Newport (51 percent) and Molnykit Company of Japan (49 percent)

KERTAJATI INTERNATIONAL AIRPORT *(INDONESIA)*

PROJECT DETAILS:
Project involves the construction of an international airport with a handling capacity of 70 million passengers per annum. Planned to be implemented in three phases, the project will include the construction of four runways, two terminals, a taxiway, and other facilities

PROJECT STAGE: Execution
PROJECT VALUE: $1.12 billion
PROJECT OWNER: Ministry of Transportation, Indonesia
PLANNING AUTHORITY: Ministry of Transportation, Indonesia; Provincial Government of West Java
EPC CONTRACTOR: PT Waskita Karya

2012
- MoT announced plans to develop airport as part of the initial MP3EI; it is one of seven airports to be built under PPP schemes

2013
- Provincial government paid $27 million to acquire the land with land acquisition process underway
- PT Waskita Karya was appointed EPC contract

2015
- Construction activities are underway and West Java Governor is optimistic that the Airport will be completed by 2017 and be operational in 2018

Source: APRC analysis of data from Construction Intelligence Center

RAIL AND ROAD INFRASTRUCTURE

Land transportation, including railways and roads (toll and non-toll), is another key focus. Currently, by cumulative dollar value, it is the greatest contributor to Asia's project pipeline – largely due to China's Belt and Road Initiative, the drive to expand tourism, and the need to accommodate rapid urbanization and industrialization.

Projected growth in rail infrastructure, averaging 8 percent between 2016 and 2020, is expected to be supported by urban and inter-city projects and the continued expansion of China's highspeed rail network (to 30,000 km by 2020 and 38,000 km by 2025 from 19,000 km at the end of 2015).[49] Mass transit projects are key features of the pipeline across major urban centers in Asia as the region grapples with an increasing demand for public transportation. In May 2016, China's Ministry of Transport announced a joint three-year plan (2016-2018) with the National Development and Reform Commission (NDRC) to invest CNY4.7 trillion across 303 transport infrastructure projects.[50]

Beyond Asia, rail is also experiencing strong growth in the US, where railroads have quietly become the de facto alternative pipeline for the oil and gas industry, with oil by rail increasing from 10,000 carloads in 2008 to 408,000 in 2013 – moving as many as 1.5 million barrels a day.[51]

Toll roads are expected to continue to be one of the main drivers of growth in the transport infrastructure sector. Spending on roads is forecast to rise as car ownership booms and issues of heavy traffic congestion become more apparent. For example, in Indonesia, over 50 of the 225 National Strategic Projects designated by President Jokowi in 2015 are toll and non-toll roads.[52]

GOVERNMENT GUARANTEES CAN DRIVE PROJECT BANKABILITY

However, the building of such infrastructure requires vast areas of land and therefore land approval permits with all zonal stakeholders are necessary (central planning authorities, municipal authorities, other permit authorities, etc.). This potentially leads to severe project delays. In addition, there are other concerns such as traffic risks, demand risks and operator performance risks to worry about. Measures (such as concessions and guarantees) then have to be put in place to mitigate or transfer these risks and enhance overall project feasibility and bankability.

For example, the Thai-China railway project has put in place an arrangement minimizing performance risk. China will be fully in charge of operations and maintenance for the first three years with a gradual transition in operations to Thailand over the next four years. Thereafter, Thai officials will take full responsibility on railway operations, with help from Chinese advisers on an ongoing basis.[53] In a separate example, the Indonesian government, in February, took on the political risk via a guarantee worth $2.8 billion for the development of four toll roads. This agreement provided security and convenience to investors, improving overall project bankability.[54]

EXHIBIT 20: EXAMPLES OF RAIL AND ROAD INFRASTRUCTURE PROJECTS

NORTH-SOUTH EXPRESS RAILWAY *(VIETNAM)*

PROJECT DETAILS:
Project involves the construction of a 1,570 km rail line connecting Hanoi and Ho Chi Minh City in Vietnam and will comprise of 27 stations. Construction works are expected to commence in 2022 and is estimated to complete by 2050

PROJECT STAGE: Study
PROJECT VALUE: $56 billion
PROJECT OWNER: Vietnam Railways
PLANNING AUTHORITY: Ministry of Transport, Vietnam
EPC CONTRACTOR: Japan International Cooperation Agency

2008
- In Q1, Vietnam Railways Corporation (VRC) announced plans for the North-South Express Railway project

2010
- Project was initially rejected by the National Assembly of Vietnam (NAV) due to its high cost
- However, it was subsequently revived after a detailed study by Japan International Cooperation Agency (JICA)

2014
- In June, the Ministry of Transport submitted a proposal to the federal government and it was approved in early 2015

2016
- It has been agreed for the Transport Ministry to submit a plan to the government by 2018 for the National Assembly of Vietnam to approve by 2020
- Hanoi General Export Import JSC (Geleximco) and Hong Kong United Investors Holding (HUI) expressed interest to develop four large-scale traffic infrastructure projects of about $50 billion – one of the projects being the North-South express railway project

TRANS-SUMATRA HIGH GRADE HIGHWAY – LAMPUNG *(INDONESIA)*

PROJECT DETAILS:
Project involves the construction of a 2,600 km toll road, which will link the provinces of Lampung and Aceh in Sumatra Island, Indonesia. Implemented in 24 sections, the construction works commenced in 2014 and are estimated to complete by 2025

PROJECT STAGE: Execution
PROJECT VALUE: $24.6 billion
PROJECT OWNER: Ministry of Public Works, Indonesia
PLANNING AUTHORITY: Ministry of Transportation, Indonesia
EPC CONTRACTOR: PT Hutama Karya; PT Pembanunan Perumahan; Waskita Karya; PT Adi Karya; Wijaya Karya

2012
- Once tendered in 2006, the project was put on hold and only later included in the list of priority projects by the government in 2012

2014
- The groundbreaking ceremony of the first stretch of the toll road was held in October and construction works started soon after

2016
- Contractors were complaining about the slow process in land clearing which resulted in the government stepping in to accelerate the land acquisition process

2017
- The land acquisition for this project has reached 75 percent and the team is hoping to finish all remaining land acquisition by March

DARK RED METRO LINE *(THAILAND)*

PROJECT DETAILS:
Project involves the construction of an 80.8 km rail line connecting Pathum Thani, Bangkok and Samut Sakhon in Thailand. Comprised of 36 metro stations, the construction works commenced in 2014 and are estimated to complete by 2020

PROJECT STAGE: Execution
PROJECT VALUE: $2.5 billion
PROJECT OWNER: State Railway of Thailand
PLANNING AUTHORITY: State Railway of Thailand
EPC CONTRACTOR: Uniq Engineering and Construction Plc; Chunwo Construction & Engineering Co.

2006
- SRT announced plans to build the Dark Red Metro Line project in Bangkok

2009
- The project managed to secure $685 million from the Japan government in 2009

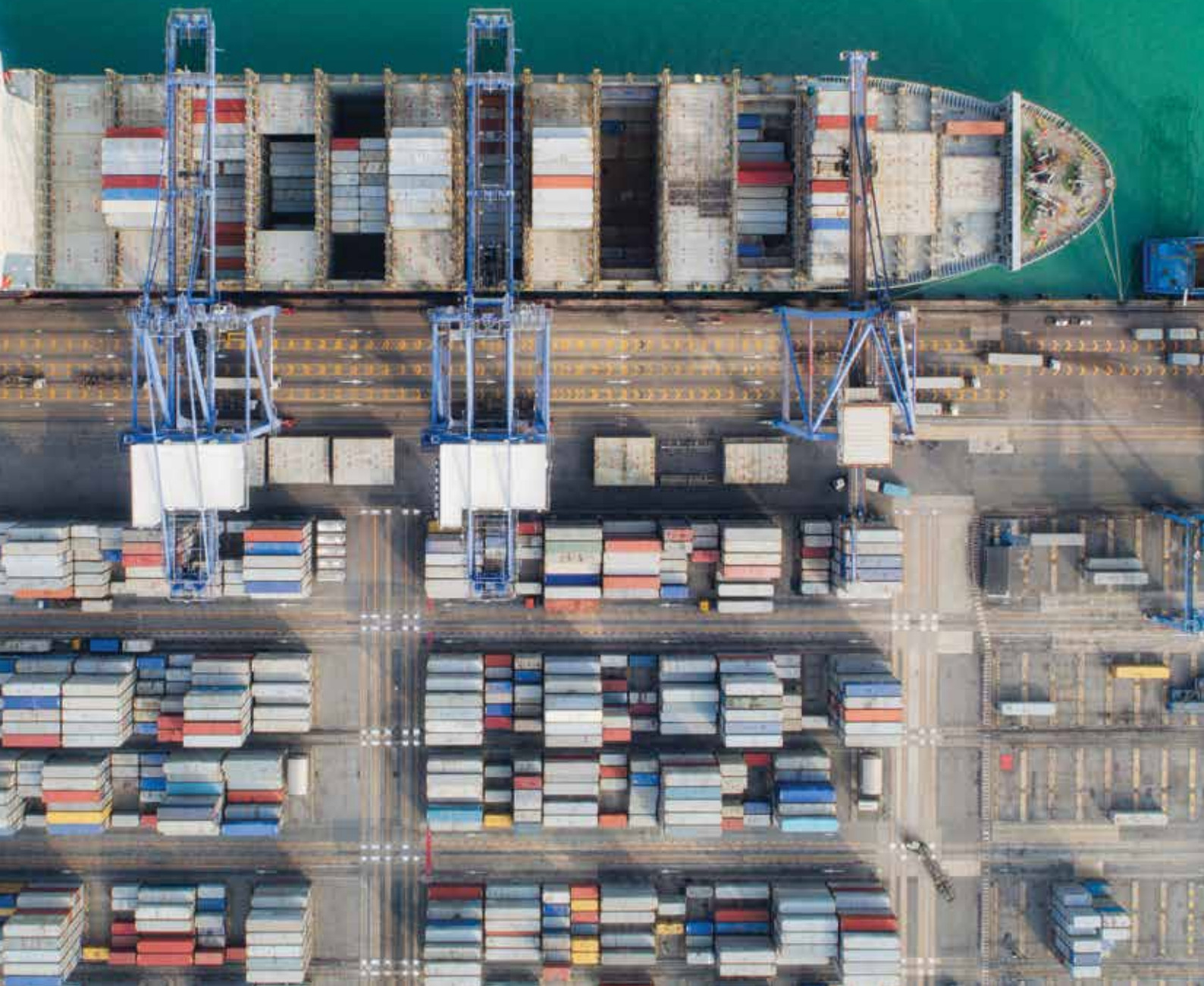
2014
- Despite funding, not much construction was done due to contract disputes, land acquisition issues, and successive redesigns and changes

2016
- The Thai cabinet announced it has approved the construction of extensions worth $1.3 billion to the Light Red Line and the Dark Red Line which are scheduled to be operational in 2020

Source: APRC analysis of data from Construction Intelligence Center

THE GROWING IMPORTANCE OF ASEAN

ASEAN WILL EMERGE AS AN ADDITIONAL GROWTH ENGINE FOR INFRASTRUCTURE DEVELOPMENT GLOBALLY



It is expected that in 2020, the Association of Southeast Asian Nations (ASEAN) will make up almost half of total infrastructure spend in Asia-Pacific (excluding China and Japan). Of this, Indonesia, Thailand, and Vietnam are expected to make up 84 percent of the pie. Developed Asia-Pacific countries like Australia, New Zealand, and South Korea, on the other hand, are expected to see slower growth in their infrastructure spend as compared to their developing counterparts (see Exhibit 21).

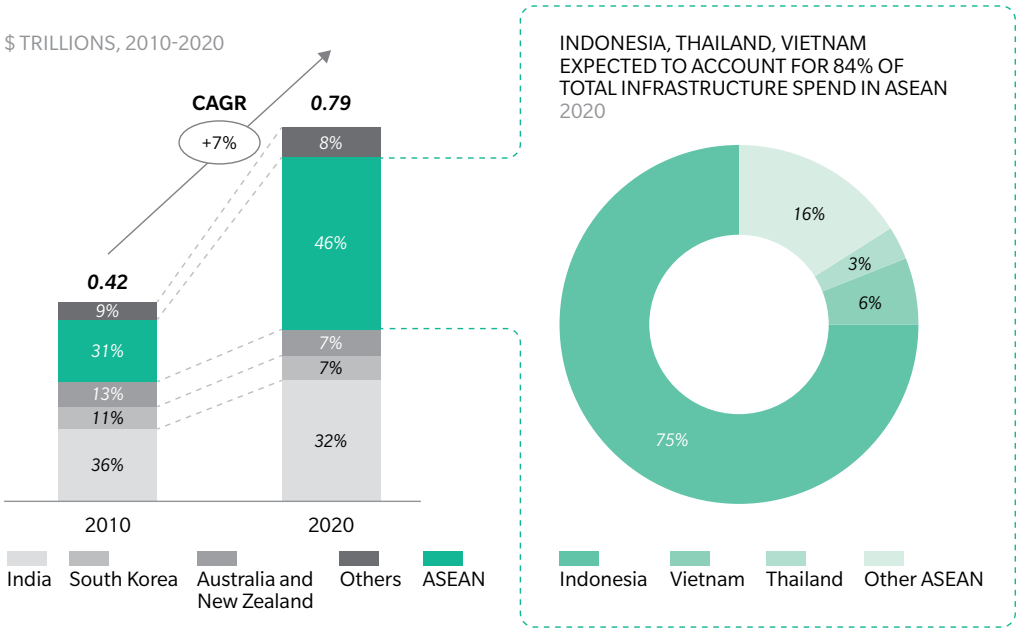
Political willpower for economic development, positive legal and financial reform, and a push towards greater regional connectivity are just three of the reasons behind the growing expectation that ASEAN will emerge as an additional growth engine for infrastructure development globally.

Indonesia is expected to be the standout ASEAN performer due to positive investor confidence following President Joko Widodo's ambitious infrastructure plan, which is part of the overall Nawacita master plan.

Malaysia, Vietnam and the Philippines are also set to continue growing rapidly and benefit from the general expansion in industrial activity and international trade. Thailand, another member of ASEAN, also posted rapid growth in 2015, as the Thai cabinet made progress in pushing ahead with plans for infrastructure development by launching a "Fast Track PPP" initiative with a Project Advisory Committee similar to that of Indonesia. However, any potential political unrest in Thailand could undermine its appeal to investors.

With this, the following pages delineate the respective countries' infrastructure outlooks, the progressions made by governments, and the remaining challenges in sight. Examples are provided in relation to how some of these reforms are closely linked to the set of key success levers outlined by Marsh & McLennan Companies' Asia Pacific Risk Center.

EXHIBIT 21: INFRASTRUCTURE EXPENDITURE ACROSS ASIAN ECONOMIES (EXCLUDING CHINA, JAPAN)



Source: APRC analysis of data from Construction Intelligence Center

INDONESIA

EXHIBIT 22: CORE COUNTRY INFRASTRUCTURE METRICS AND STATISTICS

GLOBAL COMPETITIVENESS INDEX

INFRASTRUCTURE SCORE

OVERALL RANKING

KEY INDICATORS[*1]

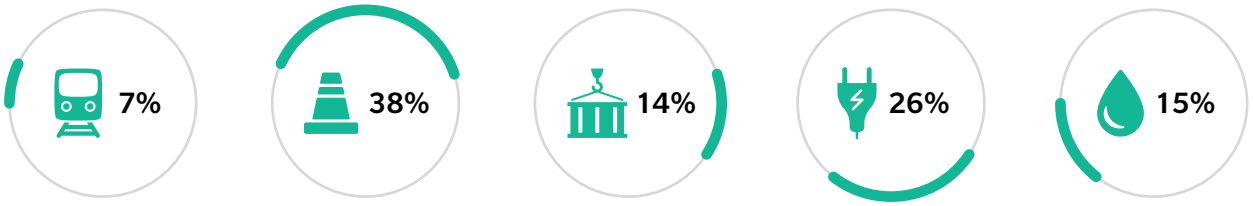
GDP per capita
$3,347

Population
257 million

FDI, Net inflows (BoP)
$20.1 billion

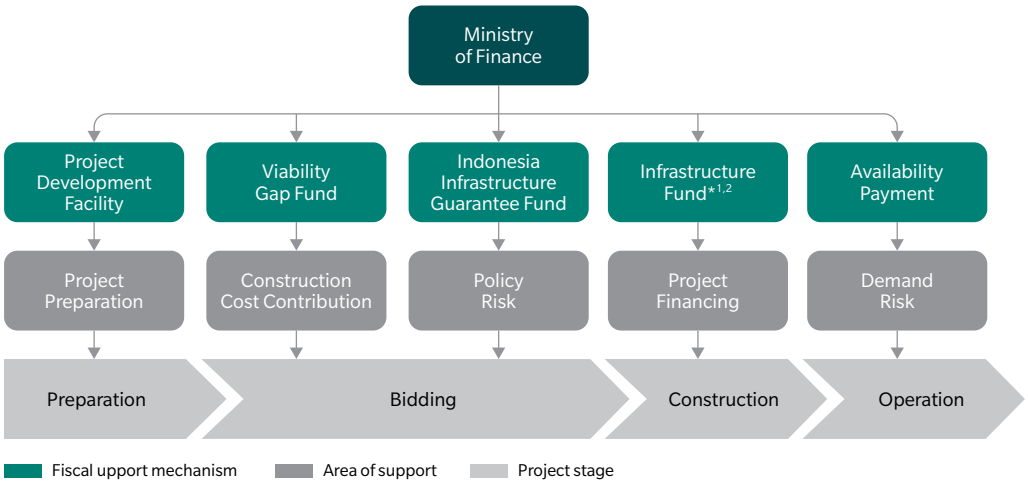
INDONESIA INFRASTRUCTURE SPEND IN 2015 (BREAKDOWN BY SECTOR)

$157 BILLION



[*1] World Bank's Data – 2015 figures all measured in current $
[*2] Includes airports, dams, ports, land control systems, and inland waterway infrastructure
[*3] Includes telecommunications, sewage infrastructure, and water infrastructure
Source: APRC analysis, World Economic Forum, Construction Intelligence Center

EXHIBIT 23: INDONESIA'S STREAMLINED PROJECT APPROVAL PROCESS



*1 SMI: PT Sarana Multi Infrastruktur
*2 IIF: PT Indonesia Infrastructure Finance
Source: APRC analysis, Indonesian Ministry of Finance

After taking office in October 2014, President Jokowi has, in his first term, set part of the National Medium-Term Development Plan (RPJMN) 2015-2019 to focus on developing infrastructure. The ambitious five-year infrastructure investment plan to also boost the country's economic growth consisted of constructing about 3,300 km of rail, 1,000 km of toll roads, 35 GW of electricity power plants, 24 new seaports, and 15 new airports, and will cost an estimated $85 billion annually till 2019.[55]

BALANCING PUBLIC AND PRIVATE INVESTMENT

In contrast to some ASEAN peers, the Jokowi government is determined to finance some of the country's major projects via funding from mostly state-owned enterprises, acknowledging that some PPP projects stall due to political interference.

In order to aid the Indonesian government in its development program, the Asian Development Bank (ADB) approved combined funding of $10 billion for both physical and social infrastructure in February 2016.[56]

However, this funding and government spending alone are not sufficient to fund Indonesia's master plan of about $470 billion spending in infrastructure investment. The authorities acknowledged that both domestic and foreign investor participation are essential to bridge the country's infrastructure funding needs.[57]

Consequently, there have been market friendly reforms in recent times, such as a streamlined infrastructure project approval process (see Exhibit 23), and the revised land acquisition law passed in February 2015. With this revised law, infrastructure projects are expected to face fewer headwinds; this is especially true of road works (both toll and non-toll), which should progress towards completion much faster in the near future. This will help Indonesia better address its issues of heavy traffic congestion and high logistics costs.

In the energy sector, the administration has implemented a three-stage Fast-Track Programme that looks to add 35 GW of new capacity by 2019, with a goal to push the electrification rate from 79.6 percent in 2013 to 97.8 percent in 2022.[58] In order to meet this goal, the government has not only invited independent power producers to build power plants and supply electricity, but has also refined its regulations on land acquisition to garner more interest from the private sector. Recent changes in regulation affect PLN's traditional risk allocation terms, though it remains to be seen exactly how this will impact future project bankability.[38]

They have also started providing guarantees for Indonesia's State Electricity Company, PT PLN, to honor power purchase agreements to mitigate the risks for private investors and to increase bankability of projects.[59] In addition, the government is striving to generate about a fifth of its total energy consumption through renewable sources by 2019, which has led to the rise of a number of large-scale renewable energy construction projects. One notable project underway is the construction of the 6.09 GW Kayan River hydroelectric power plant project in North Kalimantan that has an investment of about $18 billion.[60]

AS ALWAYS, CHALLENGES REMAIN

It is worth noting that PPP implementation in Indonesia has enjoyed varying degrees of success across sectors. While it has been somewhat successful for power and road projects, there has been insufficient interest in key infrastructure assets such as airports and deep-sea ports, which till now have been fully funded by either the government budget or state owned enterprises (SOEs).[61] Ongoing changes in regulation, including reductions in the attractiveness of PPA terms, means that the Indonesian government still has some way to go to attract new international investment on a consistent basis, however the demand is clearly there at a national level to support a long pipeline of projects.

THAILAND

EXHIBIT 24: CORE COUNTRY INFRASTRUCTURE METRICS AND STATISTICS

GLOBAL COMPETITIVENESS INDEX

INFRASTRUCTURE SCORE

OVERALL RANKING

KEY INDICATORS*1

GDP per capita
$5,815

Population
68 million

FDI, Net inflows (BoP)
$9.0 billion

THAILAND INFRASTRUCTURE SPEND IN 2015 (BREAKDOWN BY SECTOR)

$7.1 BILLION

*1 World Bank's Data – 2015 figures all measured in current $
*2 Includes airports, dams, ports, land control systems, and inland waterway infrastructure
*3 Includes telecommunications, sewage infrastructure, and water infrastructure
Source: APRC analysis, World Economic Forum, Construction Intelligence Center

As in Indonesia, the Thai government is looking to develop infrastructure and plans to invest about $100 billion in various new transport projects under its Infrastructure Development Master Plan (2015-2022).[62] This plan comprises five key programs aimed at improving the competitiveness of the economy: urban connection, rail connection, airports upgrades and expansions, sea port expansions, and road expansions.

STREAMLINED PROJECT APPROVALS

In an attempt to increase private sector participation and investment, a new PPP act was introduced by the Thai government in April 2013 (see Exhibit 25). The legislative changes are geared towards streamlining the project approval process through the PPP Policy Committee. It aims to reduce the average period to start construction after the announcement of the project from over two years to just under a year. Thailand's PPP strategic plan 2015-2019 encompasses a total of 66 projects valued at $40.5 billion with the lion's share of the budget (96 percent) being allocated across 29 transportation projects.[63] The Thai government hopes to extend its PPP success in the power sector – where private sector participation has doubled to over 60 percent of electricity generation in the last fifteen years – to the transportation sector.[61]

Furthermore, the Thai cabinet has, in December 2015, rolled out an "Action Plan 2016" to accelerate 20 transportation projects of about $50 billion, of which five are categorized under the PPP fast track process to incentivize private sector participation.[64] These five projects make up about a fifth of the budget for "Action Plan 2016": the development of Bangkok's Metropolitan Rapid Transit (MRT) Pink Line and MRT Yellow Line, the Blue Line extension, and two motorway projects (Bang Pa-In-Nakhon Rachasrima and Bangyai-Kanchanaburi). A year later, the cabinet further approved an infrastructure plan worth more than $25 billion that includes 36 infrastructure projects consisting of roads, rails, air transport and ports. It is expected that about 65 percent of these projects will be financed by debt, and the remaining through the government budget, PPPs, and the newly launched infrastructure fund.[65]

After the Asean Economic Community came into effect in 2015, the Thai government used its economic advantage as a central hub to boost government-to-government high speed railway development. The Thai and Chinese governments are in discussion over a high speed railway project, with some project estimates suggesting the total project cost to reach $16.1 billion.[66] With the push for transport infrastructure, not only will there be significant growth potential, there will also be a reduction in logistics costs and congestion in Thailand.

EXHIBIT 25: THAILAND'S PRIVATE INVESTMENT IN STATE UNDERTAKING ACT (2013)

INITIATIVES	BENEFITS
• A comprehensive institutional and regulatory framework with standard contract terms and guidelines on management of projects • A project development fund to support PPP projects by providing firms with seed money to conduct feasibility studies • Establishment of a PPP Policy Committee chaired by the PM and the State Enterprise Policy Office (SEPO) to be responsible for the secretarial tasks of the Committee • A Public-Private Partnership "Master Plan"	• Streamlined procedures • Clearer time frames • Better project evaluation and allocation of risks • Better procurement methods • Transparency • Increased attractiveness to private sector investment

Source: APRC analysis, State Enterprise Policy Office (Ministry of Finance, Thailand), AustCham

INVESTMENT DRIVEN BY FINANCIAL GUARANTEES

In the energy sector, the government, under its Power Development Plan 2015-2036 (PDP2015), is looking to increase power capacity by 58 GW by 2036. State-owned power utility Electricity Generating Authority of Thailand (EGAT) has announced an investment of almost $20 billion for a five year plan of generation and transmission system expansion (2016-2020).[67]

The government has introduced a number of policies to encourage investment in renewable energy projects, including feed-in tariffs, tax incentives, and energy production payments.[62]

These policies are expected to support government plans, outlined under the Alternative Energy Development Plan (AEDP), to generate a fifth of total power consumption (up from 8 percent in 2014) from renewable sources by 2036. Under the plans, solar, biomass, and hydro will become the top three sources of renewable power in the country and account for 75 percent of clean energy generation.[68]

VIETNAM

EXHIBIT 26: CORE COUNTRY INFRASTRUCTURE METRICS AND STATISTICS

GLOBAL COMPETITIVENESS INDEX

INFRASTRUCTURE SCORE

OVERALL RANKING

KEY INDICATORS[*1]

GDP per capita
$2,111

Population
92 million

FDI, Net inflows (BoP)
$11.8 billion

VIETNAM INFRASTRUCTURE SPEND IN 2015 (BREAKDOWN BY SECTOR)

$13.3 BILLION

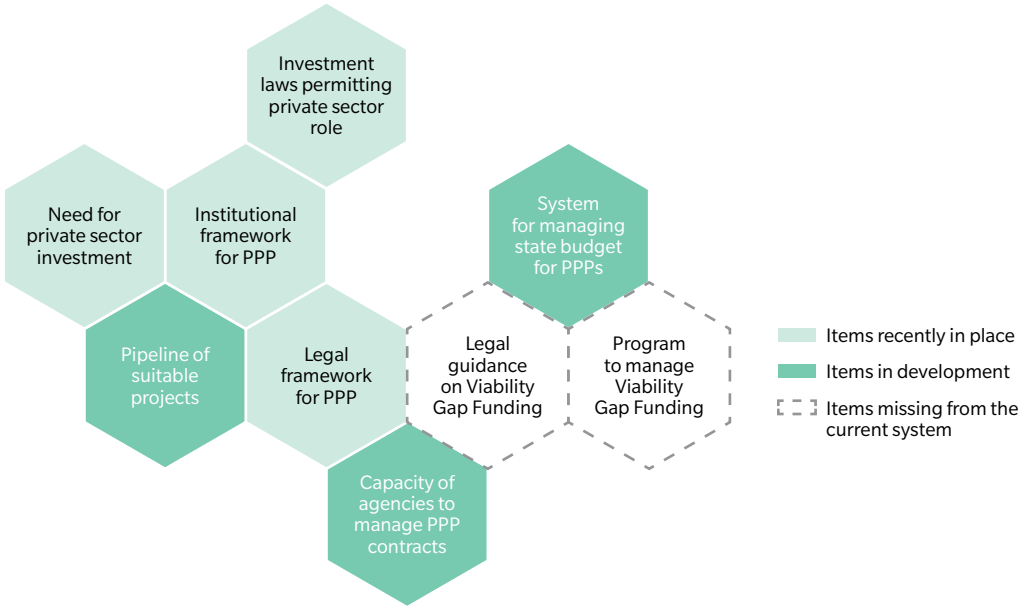
[*1] World Bank's Data – 2015 figures all measured in current $
[*2] Includes airports, dams, ports, land control systems, and inland waterway infrastructure
[*3] Includes telecommunications, sewage infrastructure, and water infrastructure
Source: APRC analysis, World Economic Forum, Construction Intelligence Center

Vietnam is taking gradual steps in liberalizing its economy, in parts by relaxing its industry regulations and in parts by embracing more PPPs to attract further private-sector participation in the infrastructure sector. As the government lacks the fiscal capacity to meet its infrastructure financing requirements, this move helps to facilitate the divestment of state-owned enterprises and also expand the pool of resources available for more infrastructure projects.

In 2015, the government issued the regulation Decree 15 which covers PPP investments (see Exhibit 27). The regulation provides a single legal framework for private investments in public infrastructure. According to PPP Knowledge Lab, there were 68 Build-Operate-Transfer projects as of mid-May 2016 that were formulated under the management of Vietnam's Ministry of Transport, amounting to about $176 billion.[69] In 2016, Vietnam's foreign direct investment inflow surged to a record $15.8 billion as Vietnam's efforts to improve infrastructure and lure more foreign investors began to have an impact.[70]

Alongside this, the growing populations and rapid urbanization of key cities like Hanoi and Ho Chi Minh City will undoubtedly require more infrastructure, pushing the growth in infrastructure spending in Vietnam. In its Railway Development Strategy until 2020, the Vietnam government is looking to invest about $10 billion to develop railway infrastructure in the country with plans to upgrade the 2,237 km meter-gauge rail network and 1,726 km of single track main line between these two key cities.[71]

EXHIBIT 27: VIETNAM'S NEW PUBLIC-PRIVATE PARTNERSHIP DECREE 15



Source: World Bank's Public-Private Partnership in Infrastructure Resource Center (PPPIRC) website

The Government needs to accelerate energy sector reform, including price reform, aggressively promote investments in renewable energy and enhance transparency around the plans.[77]
Louise Chamberlain, Country Director, United Nations Development Programme (UNDP) Vietnam

In addition, these cities are looking to establish better transport infrastructure within and between them in attempts to ease congestion and the pressure on existing networks, and also reduce air pollution. Out of the combined $4.6 billion of funds that they are seeking, Hanoi is looking to borrow half of that amount through the ADB and Japanese Official Development Assistance (ODA) to develop key metro lines which require a total investment amount of $2.7 billion, the remaining $0.4 billion funded by its city's budget. While Ho Chi Minh City is looking to use $2.3 billion to solve its chronic traffic congestion and flooding, it is estimated that they would require close to $22 billion from now till 2021 in order to meet its urban infrastructure needs.[70]

PPP TRANSPARENCY NEEDS TO BE ADDRESSED

In the energy sector, the Vietnamese government is striving to generate enough electricity to power almost every home by 2020; the country's power production expected to grow 14 percent annually between 2015 and 2030.[72] The country's General Department of Energy estimates that $148 billion is needed in developing Vietnam's energy grid in the period between 2016-2030.[73]

This investment is needed in order to keep up with the power demand generated by urbanization. Since 2012, Vietnam has allowed independent power producers to enter the market after launching its competitive generation market scheme, the first of three phases of its power market development roadmap.[74]

Further, the November 2016 ratification of the Paris Agreement means that the government will have to focus more effort on reducing Vietnam's reliance on new coal-fired power plants. According to The General Directorate of Energy, Vietnam, the government aims to increase its share of renewable energy to more than a tenth of its total power production by 2030 from less than 4 percent in 2015, with an emphasis on the development of wind and solar energy infrastructure.[75] There are significant challenges that must be overcome to make this happen however and it will require both effective government action and the technical expertise in renewables of international companies. Despite Decree 15, one of the key challenges that remain to private sector PPP investment in the country is the perceived lack of transparency in the current PPP planning, tendering and monitoring processes. Further reform is required to bring the country in line with many Asian peers in this regard.[76]

CONCLUSION

It is clear that the expected demand for infrastructure in Asia far exceeds the public sector's ability to finance them. Private sector investment into infrastructure is as critical an imperative now as it has ever been. If no action is taken, economic growth in the region will stall and the social implications will be profound.

Governments in the region must take responsibility to change their local legal, financial and regulatory environments to support fair and transparent infrastructure development. Not surprisingly, it is often the countries with the largest need for foreign investment in infrastructure which have the most work to do to create such an environment. Public-private partnerships will play a key role in changing the infrastructure landscape in the region. Where these are structured effectively and with appropriate risk allocation, the value will come not just from the supply of private sector capital, but equally from broader private sector expertise in deal financing and efficiency gains from the improved management of operational assets.

Ultimately, projects need to be seen as bankable, and also provide competitive returns on a risk-adjusted basis when compared to global alternatives. The guarantees offered by governments and multilateral development banks will continue to be important in this regard, as will the use of broader risk mitigation and transfer mechanisms.

Despite the known challenges, it is an exciting time for the infrastructure industry in Asia.

The future demand for power in the region is unquestionable. What remains to be seen is how the concept of the Energy Trilemma (achieving a balance between energy security, cost of supply and environmental impact) affects the investment and technology decisions taken by governments in the region.

China's Belt and Road Initiative has a long way to go before it can be considered a success, but the scheme undoubtedly has great potential. However, questions remain as much around the geopolitical implications of the investments, as around financing and bankability concerns. The initiative is therefore ripe for further cross stakeholder collaboration and research.

Increased regional cooperation will not just be led by China. Discussions continue around a potential ASEAN Power Grid, while India, Nepal, Bangladesh, Bhutan, Myanmar, and Thailand are progressing with a scheme to link the countries through a highway network. The outcome of the Regional Comprehensive Economic Partnership (RCEP) trade agreement, due in 2017, will likely have a knock-on impact on infrastructure development in the region too.

While governments in Asia must take the lead in creating a more transparent and conducive environment for infrastructure investment, other stakeholders should not wait patiently in the background. Those who start building their local knowledge, capabilities and partnerships now will be best placed to benefit from future changes that this report has outlined.

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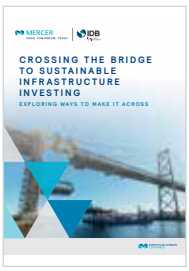

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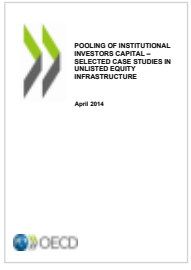

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