Frontier International

Asian infrastructure research trip

March 2026

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Frontier Advisors | Forefront Thinking

About us

Frontier Advisors has been at the forefront of institutional investment advice in Australia for over thirty years and provides advice on around $900 billion of assets across the superannuation, charity, public sector, insurance and university sectors.

Our purpose is to empower our clients to advance prosperity for their beneficiaries through knowledge sharing; customisation; technology; and an alignment and focus that is unconstrained by any product conflicts.

Lucy Minichiello

Head of Real Assets

Lucy Minichiello is Frontier's Head of Real Assets leading a team of infrastructure and property specialists. Lucy has over 20 years of experience in a variety of roles and brings a breadth of experience across funds management, mergers and acquisitions and capital markets. Prior to joining Frontier in 2025, Lucy held the role of Director, Portfolio Management at Westbourne Capital and previously held positions at Pricewaterhouse Coopers, Challenger Infrastructure Fund, Goldman Sachs and Citigroup including working in Citigroup's London and New York offices. Lucy holds a Bachelor of Arts (Economics) from the University of Melbourne, a Bachelor of Business (Marketing) from RMIT and is a qualified CA.

Dan Cave

Senior Consultant

Dan joined Frontier as a Senior Consultant in August 2023 and is a member of the Real Assets Team. Dan has responsibility for undertaking investment and manager research with a focus on infrastructure and property. Prior to Frontier, Dan worked at Zenith Investment Partners for six years undertaking manager research. He had sector lead responsibilities across listed infrastructure, listed property and real assets. Prior to this Dan worked as a financial adviser for two years. Dan holds a Bachelor of Business (Economics and Finance) from RMIT and is RG146 compliant.

Introduction

Frontier has advocated for client exposure to Asian infrastructure within a diversified global infrastructure portfolio since 2020 following an extensive research trip to the region.

However, interest in Asian infrastructure from Frontier clients and Australian asset owners in general has remained relatively subdued. With this in mind, our Real Assets Team conducted a research trip to Asia in November 2025 to re-test the investment thesis, visiting Singapore, Japan and South Korea.

The team met fund managers with dedicated Asia and Asia-exposed strategies to discuss the opportunities and challenges investing in this area of the world. These perspectives were supplemented by meetings with Austrade and Japanese researchers on the ground, providing some unique perspectives on the Japanese market.

The trip confirmed the findings of our 2020 research paper, which showed positive investment opportunities in Asian infrastructure, although such opportunities come with challenges. A thoughtful and nuanced approach to investing in these markets is required. We continue to support a minority allocation to Asian infrastructure in our annual infrastructure sector configuration review, subject to an investors' appetite for risk, complexity and cost.

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The case for Asian infrastructure

Key macro drivers underpinning infrastructure investment provide strong support for growth in the Asia region.

Macro tailwinds, including strong population growth; an expanding middle class; increases in GDP per capita; accelerating urbanisation; and supportive government policies are driving infrastructure investment within the region. As shown in Figure 1, GDP growth in Asia's growth markets[1] is expected to remain well above developed markets, helped by younger populations. By 2035, about 24% of people in developed markets are expected to be over 65, compared with about 11% in growth Asia. Further, the size of the middle class in growth Asia has been and is expected to continue to be larger than developed markets. These macro factors are expected to drive a need for sustained investment in infrastructure.

Figure 1: Structural macro drivers of Asia's growth markets[1]

	GDP Growth % CAGR		Demographics % of population above 65		Consumption # of middle-class households (millions)	
	Last 20 years	Next 10 years	Current	2035	Current	2035
Growth Asia[1] (ex-China)	5.6%	5.4%	7.6%	10.9%	126	140
Developed Markets (G7)	1.6%	1.5%	20.2%	23.7%	89	92

Source: Fund managers, World Bank, Euromonitor, International Monetary Fund

In addition to strong macro drivers, investment in the region is supported by global thematics such as digitisation, decarbonisation and domestic reshoring, which will present significant infrastructure investment opportunities.

The funding gap

Currently public sector funding accounts for 90% of total infrastructure investment in Asia, unlike most western markets where private capital plays a substantial role. In the future, across both developed and developing countries, the funding shortfall is expected to be met largely by private capital, principally foreign investment.

On transport alone, the Asia-Pacific region is estimated to have investment needs across the transport sector of approximately 2.1% of GDP from 2020 to 2035 or US$2.7 trillion annually.

[1]Growth markets include India, Indonesia, Philippines, Malaysia and Thailand

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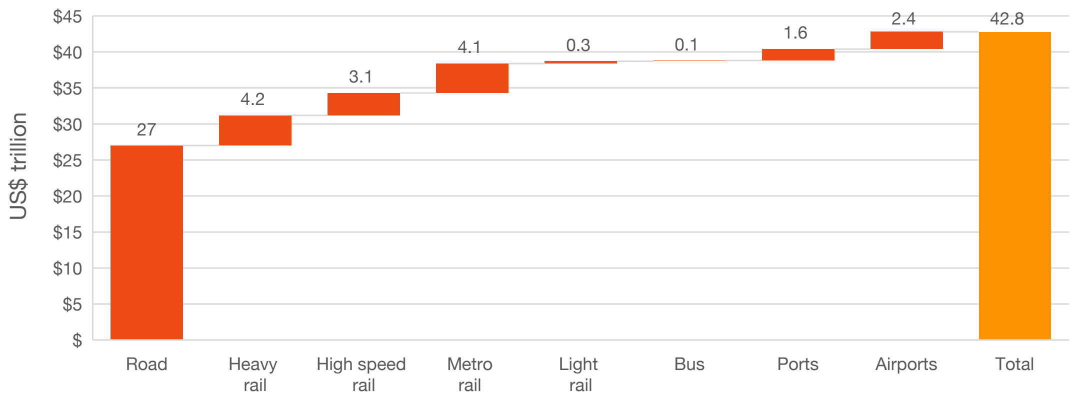
Figure 2: Asia-Pacific transport infrastructure needs (2020 to 2035)



Source: Asian Transport Observatory

Various government schemes and policies across the region are supportive of infrastructure investment. Net zero targets are driving significant investment in renewable energy while Southeast Asian countries are increasingly adopting public to private (PPP) models to finance their infrastructure needs. Indonesia, for example, has an existing pipeline of over 55 PPP projects at an estimated value of US$36 billion at various stages of planning, tendering, contracting and construction.

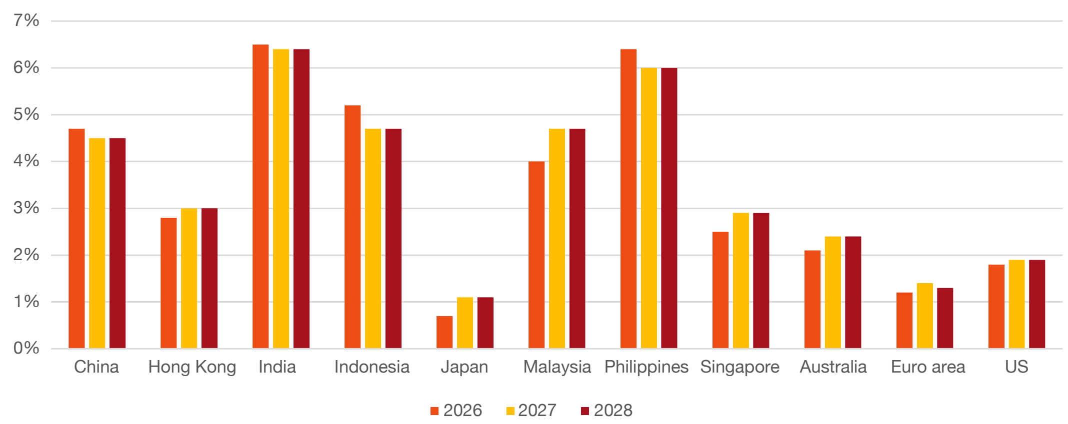
Global infrastructure funds typically offer limited exposure to Asia, usually confined to developed Asia given typical OECD mandates. Moreover, fundraising for Asia-focused or Asia-exposed infrastructure funds has been modest relative to global or US and European regional strategies given limited investor appetite to date.

Rapid growth and potential for higher returns

Asia has experienced rapid consumer and trade growth for decades which accelerated in the 1990s and continued strongly through the 2010s and 2020s. The region comprises a mix of stable markets such as Japan and South Korea, and emerging economies such as India and Southeast Asian countries. Not surprisingly, investment in growth-oriented economies such as India has the potential to provide higher equity returns for established core assets with toll roads offering gross returns of about 14% per annum in local currency. Further, investment managers will actively seek opportunities to enhance returns by taking core-plus risk such as investing in development platforms and applying other value-creation strategies.

Notwithstanding this, we highlight countries such as the Philippines and India who stand out for their high variability in GDP growth over time, with a corresponding impact on the variability of returns. Further, investment managers need to assess markets for the potential for cyclicality in foreign direct investment (FDI) capital flows.

Figure 3: Real GDP growth forecasts (2026 to 2028)



Source: Trading Economics

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Developed versus developing markets

The region offers a broad range of potential investment in countries, sectors and risk profiles to build diversified portfolios. However, local expertise and a nuanced approach to investment are critical to success in this area of the world.

Developed Asia exhibits characteristics of mature economies, reasonably dependable political and regulatory frameworks and stronger rule of law. In the context of infrastructure, investment managers consider Japan, South Korea, Singapore and Hong Kong to be developed Asian markets with the rest of Asia considered developing. Notably China, despite the size of its economy, has relatively low GDP per capita due to its large population. Investment in China and Hong Kong is now typically avoided.

Table 1: Developed versus developing Asia

	Developed	Developing
Market maturity	Mature and stable markets.	High-growth and emerging markets.
Country	Japan, South Korea, Singapore, Hong Kong, Taiwan.	India, Philippines, Malaysia, Indonesia, Thailand, Vietnam.
Capital markets	Well-developed financial markets.	Nascent.
Regulatory and legal frameworks	Institutional-grade regulatory and legal frameworks.	Maturity of regulatory and legal frameworks varies.
Transparency and governance	Open and established investment hubs with strong governance and transparent legal systems.	Foreign ownership regimes continue to open up, although this varies. Presence of state-owned enterprises (SOE) and sovereign wealth funds.
Foreign currency hedging	Liquid foreign currency markets with readily available hedging options.	High interest rate differentials, non-deliverable foreign currency contracts and illiquidity can make hedging programs highly complex and expensive.
Sources of capital	Large pool of local and global financial and strategic investors, including infrastructure funds, pension funds and sovereign wealth funds.	The presence of global financial investors can be limited, including core infrastructure investors. Family-owned companies can be meaningful players in certain countries.

Source: Frontier Advisors

In terms of investment manager product strategies, approaches to the region include developed Asia only, pan Asia-Pacific (encompassing developed and developing Asia) and developing Asia, typically as a material component of a global growth markets portfolio. Developed Asia typically includes Australia and New Zealand. Country-specific strategies such as India-only have existed but are less prevalent. China and Hong Kong exposures are typically either directly excluded or are assigned a high bar for inclusion, given geopolitical risks and governance challenges.

We are broadly supportive of investment across both developed and developing Asia, subject to appropriate risk-adjusted returns, the relative attractiveness of the sector (which varies by country), robust portfolio diversification and appropriate risk management by the manager.

Implementation and access

Investment structures tend to be limited to pooled vehicles, the majority of which are closed-end funds. Pooled vehicles reflect lower demand for Asian-focused funds as separately managed accounts would typically be too small for the investment manager. Risk profiles for these vehicles will vary, from core products (usually with a premium for sovereign risk) to value-add products.

Fees are typically higher than global diversified funds with similar risk profiles. This reflects that managers have multiple investment teams spread across Asia in response to a nuanced approach to investing, which we believe is critical for success in the region.

Co-investment is typically only available with a fund commitment.

Direct investments require substantial financial commitment for asset owners given the presence of an on the ground investment team with time needed to establish relationships in the region, critical to doing business in Asia. Direct investment provides for maximum control over an investment portfolio. A number of Canadian pension funds have utilised this approach, with offices in countries such as Singapore and India.

Additionally, partnering with local players such as developers and asset owners is common and provides for local expertise, with both investment managers and direct asset owners utilising this approach. Given the challenges in gaining outright control, this approach generally requires enhanced governance processes in place.

Pan-regional platforms are a common portfolio company strategy

- Prevalent in renewables investment; ability to access Southeast Asia renewables platforms.
- Regional expansion provides an opportunity to scale the portfolio of individual assets whilst also increasing the potential buyer pool.
- Allows access to markets where a single country portfolio company may be deemed less desirable (for example, risk profile or market liquidity).
- Accommodate assets in higher-returning markets without meaningfully increasing overall risk profile.

Investment landscape

Consistent with the evolution of the infrastructure asset class, investment manager products are typically aligned with core-plus and value-add risk profiles. Notwithstanding, traditional core infrastructure sectors, such as mobile towers and toll roads, are commonly targeted.

The relative attractiveness of the investment opportunity set will vary by sector, country and the investment manager's return target and investment approach. Core assets can be targeted at potentially higher returns in developing markets which typically include a premium for sovereign risk.

The sourcing of investments will also vary. Stewardship reforms for listed companies in Japan are creating take private opportunities, and many Asian trading houses and conglomerates that once developed, financed and operated infrastructure and energy assets internally are now recycling assets and seeking capital partners to improve returns on equity.

Large scale transactions in the region over recent years demonstrate how Asia's infrastructure market is maturing, attracting some of the largest global institutional investors. Some of these transactions include:

- 2018 acquisition of Vena Energy by GIP, PSP and CIC (Asia-Pacific)
- 2023 data centre joint venture between Singtel and KKR (Singapore)
- 2023 acquisition of Avaada Energy by Brookfield (India)
- 2024 acquisition of Leap Green Energy Brookfield (India)
- 2025 acquisition of AirTrunk by Blackstone (Asia-Pacific)
- 2026 acquisition of Vantage Data Centres by Aware Super (Asia-Pacific)

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Table 2: Infrastructure manager investment activity by country and sector

High | Medium

	Pan-Asia	Australia	New Zealand	Japan	South Korea	India	Indonesia	Philippines	Rest of Southeast Asia	China/Hong Kong
Energy & utilities		Industrial		Storage Industrial	Storage District energy Waste Industrial	Trans. distribution	Waste to energy	Midstream	District cooling Waste	
Digital	Data centres Towers Fibre Subsea cable	Data centres Towers	Towers	Towers	Data centres	Data centres Towers Fibre	Data centres Towers Fibre	Towers Fibre	Data centres	Data centres
Renewables	Utility scale renewables Battery storage	Utility scale renewables Distributed generation		Utility scale renewables Distributed generation Battery storage	Utility scale renewables Distributed generation Battery storage	Utility scale renewables Battery storage		Utility scale renewables Offshore wind	Offshore wind	
Transport & logistics	Cold storage Logistics	Rail Airport Asset leasing	Asset leasing			Toll-road Logistics Asset leasing		Cold storage Logistics		
Social infrastructure			Aged care							

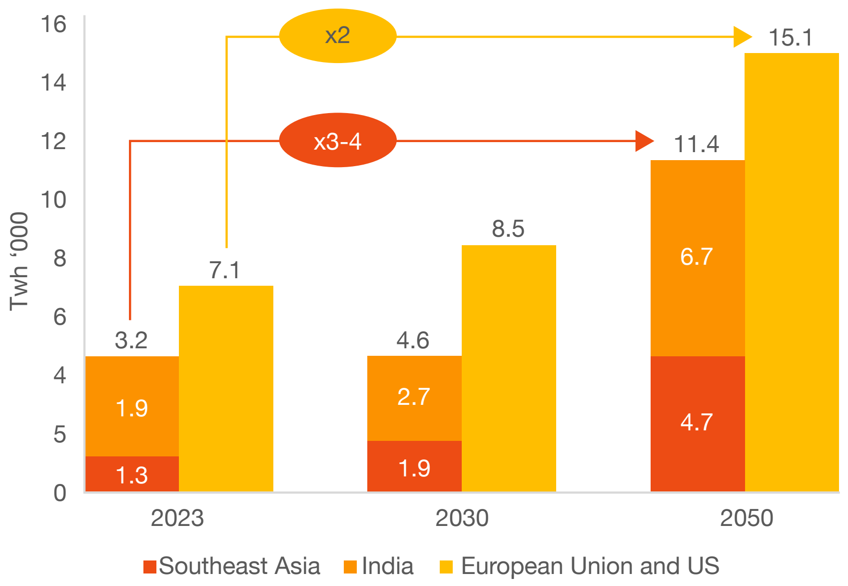
Source: Frontier Advisors, Fund managers

Renewables and the energy transition

Large, forecast increase in energy demand driven by structural growth in developing markets and an accelerated energy transition.

Many countries across Asia are heavily reliant on energy imports, which makes energy security a key priority for governments. The majority of this energy is expected to come from renewable energy sources. Strong policy support across Asia for the energy transition, including 2050 net zero targets in South Korea, Japan, Singapore, the Philippines and Malaysia, has driven significant investment. Countries with a particularly heavy reliance on fossil fuels for electricity generation, such as Singapore (approximately 95% gas) and Indonesia and the Philippines (approximately 60% coal), will require accelerated transitions to meet their renewable generation targets and emission reduction commitments, especially where load growth is forecast to increase off the back of GDP growth. As shown in Figure 4, Southeast Asia and India are expected to have three to four times the growth in electricity demand by 2050 compared to two times for the European Union and the United States.

Figure 4: Electricity demand forecast by 2050 (TWh '000)



Source: Fund managers, International Energy Agency

Other features of the energy transition build-out

- Increasing tenor of power price agreements (PPAs) and tariffs available across many Asia regions reducing price and contracting risk – contracts are now available for up to 20 to 30 years.
- Strong levelised cost of energy (LCOE) advantage for renewables over fossil fuels and imported energy.
- Potential for higher returns from brownfield investments in several markets. In India and the Philippines, construction-ready PV solar projects are delivering returns in the range of 11–16% IRR, with further upside possible from discount rate compression at brownfield or portfolio exits.
- Regional expansion provides an opportunity to scale platforms and access less liquid markets whilst opening up the potential buyer pool.
- India and the Philippines have largely liberalised energy markets, with the former being open for foreign investment for an extended period. Market and regulatory reforms continue across both developing and developed markets.
- The role of state-owned enterprises (SOEs) needs to be assessed, especially in less open market structures. SOEs can be the single buyer of energy where there is very limited market competition. Similarly, new investment projects could find themselves competing with SOEs that are investing with non-financial goals or have a nation-building mandate.
- Decarbonisation is providing investment opportunities for broader energy transition assets such as electric vehicle charging, waste-to-energy generation, district cooling and adjacencies such as offshore wind servicing vessels.

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Digital infrastructure

5G rollout, increasing data volumes and the growth of cloud and AI data centres provide further tailwinds off the back of the region's demographic and urbanisation trends.

Consistent with other global regions, demand for data centres outstrips supply with the scale of buildout and capital required being no less meaningful across key Asian markets. This will also require investment in fibre/broadband networks with investors able to access meaningful opportunities relative to the US, Europe and developed Asia. For example, broadband penetration in South Korea sits at over 46%, one of the highest penetration rates globally, which contrasts with India, Indonesia and the Philippines with single digit subscription rates. Similarly, the growth in mobile internet subscribers is globally significant.

Growth in mobile internet subscribers 2025 to 2030:

India 141m
Indonesia 38m
Philippines 16m
Asia-Pacific (ex-China) 320m

Fixed boadband penetration per person

India 2.75%
Indonesia 4.8%
Philippines 6.5%

Asia-Pacific* data centre development pipeline

Total pipeline 16,620 MW
In construction 3,281 MW
Planning/development 13,339 MW

*Asia-Pacific including Greater China

Source: GSMA, World Bank, JLL

Singapore is one of the most highly constrained markets for data centre development globally, in terms of both land and power. In 2019 a moratorium was put in place with regard to further data centre development given concerns around sustainability, in particular the ability of the Singaporean grid to provide power to existing data centres. The moratorium contributed to a data centre development boom in the neighbouring Malaysian city of Johor Bahru, easily accessible from Singapore. In 2022 the ban was partially lifted, with a strict new framework prioritising energy efficiency, renewable energy and advanced cooling technologies with a focus on quality and sustainability over volume. A second call (for tenders) was announced in late 2025 for 200MW of capacity. Before the call, 20 hectares of land on Jurong Island had been set aside for what is expected to be the city-state's largest low-carbon data centre park.

Asset visit – Singapore data centre: Keppel Data Centre Campus SGP 7 and 8

- Two stabilised data centres of 30MW capacity each.
- Carrier-neutral facilities, fully leased to US and Asian hyperscalers.
- Strong connectivity via dark fibre connections.
- High-density and 'AI-ready' with capacity of 8-15 kW per server rack.
- Water-cooled with power usage efficiency ratio (PUE) 1.2-1.3x (under the government's Roadmap, this must be equal to or less than 1.3x).
- Third data centre in development, to be located on the same site, development to occur in a phased approach.

In visiting the campus, we gained an appreciation of the modern high-density design with SGP 7 and 8 high-rises of seven and six storeys respectively, owing to their location in densely built-up Singapore. Both data centres were purpose-built for their hyperscale customers, becoming operational in 2023 and 2024 respectively.

Infrastructure realisations across the peer group

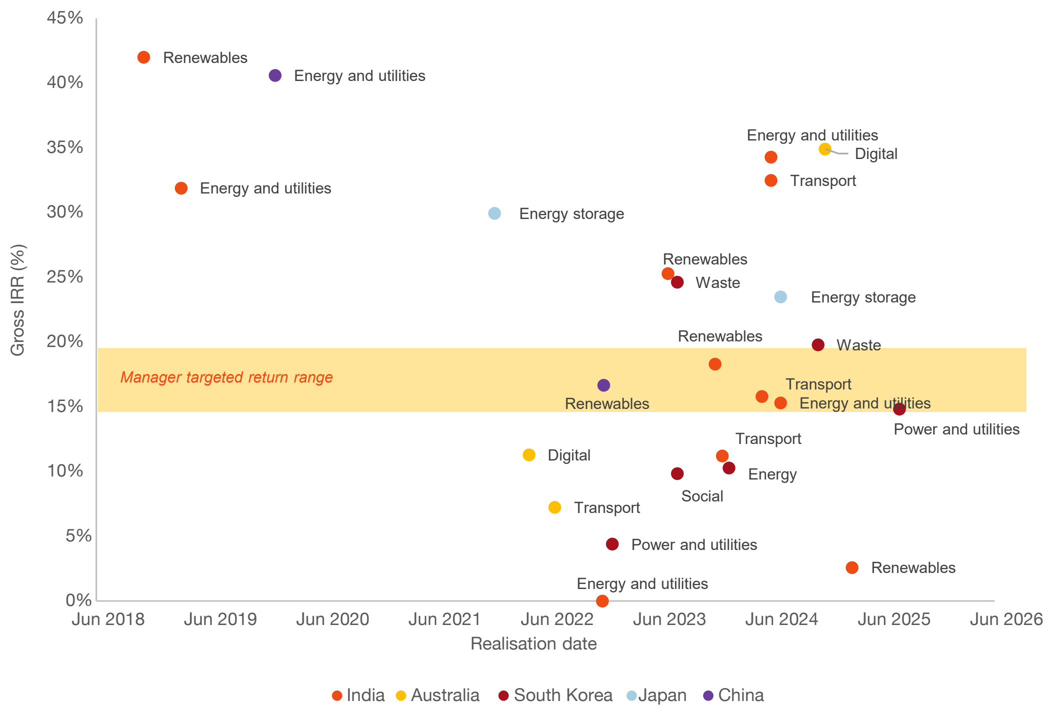
Successful exits over time provide support for the Asian infrastructure thesis.

Across Asia strategies, the infrastructure managers we met have achieved 24 full or partial exits from December 2018 to August 2025, with a median gross return of USD 19.8% per annum. This is largely in line with the gross return targets of the funds, which range from USD 14% to 21% per annum.

Empirically across the data set examined, returns appear to be skewed to the upside. Of the 24 exits, only five have realised gross returns below 10% p.a. including one with a capital return of zero. Exits have occurred primarily in developed Asia markets such as Australia, Japan and South Korea and larger developing markets such as India. These markets are characterised by deeper liquidity and broader buyer pools. Exits across the Philippines, Indonesia and other Southeast Asian countries have occurred but have been more limited.

Buyers include domestic and international institutional investors (for example, pension funds and sovereign wealth funds), other investment managers with Asia-focused strategies, local and global strategics and, to a limited degree, exit via public market listings. In the case of the latter, India offers equity market listings as a credible exit strategy for infrastructure assets. Designed to encourage greater investment in local operational infrastructure, India developed a framework for Infrastructure Investment Trusts (InvITs) which are tax-efficient listed vehicles with similar pass-through benefits for investors as real estate investment trusts.

Figure 5: Select infrastructure investment exits in Asia



Source: Frontier Advisors, Fund managers

Responsible investing

Given the global nature of capital, investment managers operate under consistent responsible investment (RI) frameworks when investing in Asia infrastructure. However, consistent with emerging market investments in public markets, there can be gaps in standard business practices, with local laws, regulations and norms varying across the region.

With regard to environmental, social and governance (ESG), both financial and reputational risks need to be considered, especially in areas such as ethical business practices, labour relations and supply chain management. Governance arrangements, including the level of control, shareholders' agreements and alignment on exit strategies, require a greater focus in developing markets.

Counterparty risk is a key area for consideration. Counterparties can include large, well-known multinational corporations, especially in the energy and digital infrastructure sectors which have been the subject of higher levels of foreign investor interest. However, investors may be subject to higher levels of counterparty risk when engaging with local governments, regulators or businesses in developing markets.

In 2024, executives from Canadian pension fund La Caisse were charged by US prosecutors as directors of investment company Azure Power, for their involvement in a bribery scandal involving Indian billionaire Gautam Adani and Indian government officials.

In many sectors, recognised international standards can be applied in areas such as the design, construction and operation of assets. For example, the International Finance Corporation (IFC), part of the World Bank, has Performance Standards which act as a global benchmark for responsible project finance across high impact sectors in emerging markets. Additionally, common real asset responsible investment frameworks such as GRESB may be used by investment managers.

Investors must have a high degree of conviction in the investment manager in terms of ESG integration, local expertise and the ability of the investment manager to manage ESG risks.

Stewardship reforms – Japan case study

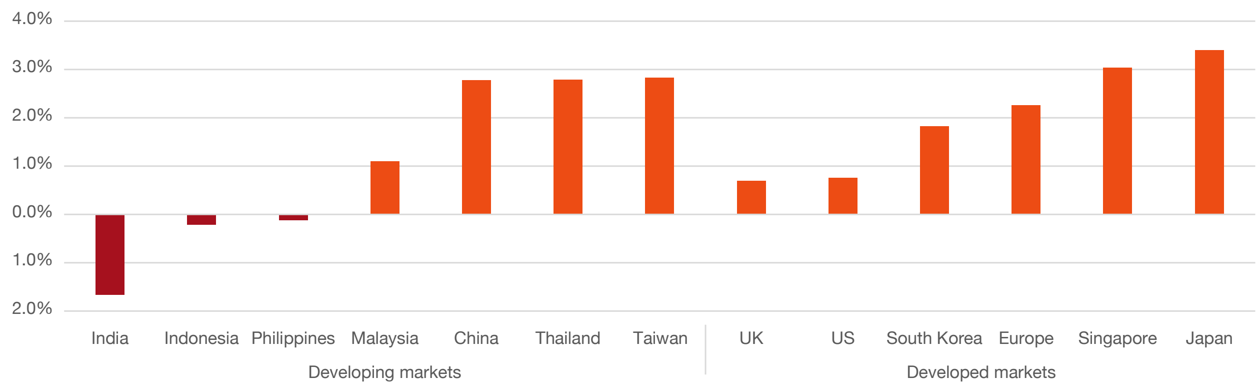
- Ongoing investment governance reforms in Japan, including updates to the Stewardship Code, changes to Tokyo Stock Exchange (TSX) listing rules and efforts by the Financial Services Agency over recent years, are seeking to strengthen long-term corporate value, improve capital allocation efficiency and improve dialogue between companies and investors. There are similar ongoing reforms in South Korea.
- With these recent reforms, global private equity buyout firms such as Blackstone, EQT, Bain Capital and KKR have been very active in Japan with take-privates and carve-outs, as have activist equity investors. In 2024 there were 30 take-private deals.
- Within infrastructure, Japan's Sogu Shosha (trading houses) and South Korea's Chaebols (family-controlled conglomerates) are key players across energy, infrastructure and industry value chains, developing, financing and operating large-scale energy and infrastructure projects. Examples include Mitsubishi, Mitsui, Itochu, Marubeni and Marunouchi in Japan and Hyundai Heavy Industries, SK Group and LG in South Korea.
- Infrastructure managers expect increasing take-private and carve-out opportunities in Japan from the trading houses and broader corporates. In South Korea, investment managers have been successful in both acquiring assets from and selling assets to conglomerates like SK Group.

To hedge or not to hedge?

Funds are typically USD-denominated with varying approaches taken by investment managers on whether to hedge foreign currencies or not.

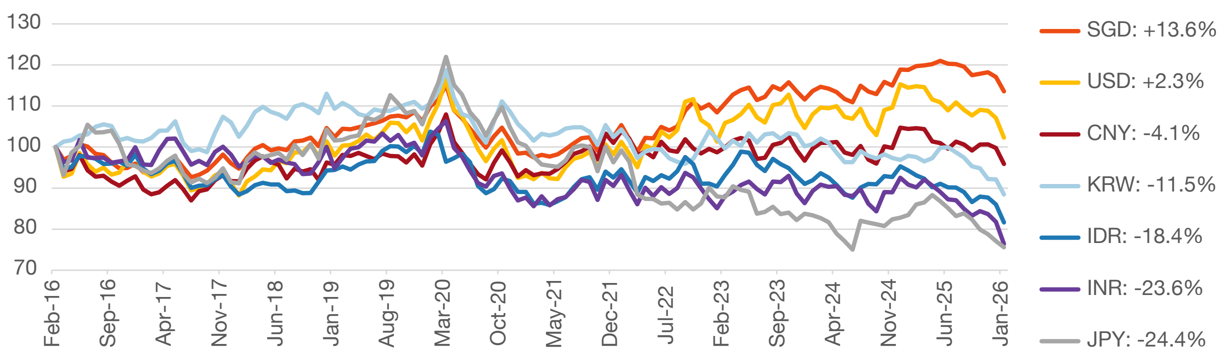
- Typically, developed market currencies will be hedged to USD, however there is more variation with regard to developing market currencies owing to higher hedging costs (incurred from elevated interest rate differentials).
- Lack of depth in developing market currencies can make foreign exchange contracts non-deliverable, with limited liquidity increasing hedging costs and collateralisation requirements relative to developed currencies. Additionally, tenors may be more limited.
- USD currency assets and contracts in sectors like data centres and maritime assets can reduce currency hedging requirements for investment managers.
- Investing via pan-Asian platforms can provide a single currency exposure where hedging can be managed within the portfolio company. This enables a simpler management of currency within investment portfolios. These pan-Asian platforms are often domiciled in Singapore noting the SGD has a very high correlation to the USD.
- In AUD terms, current interest rate differentials vary widely by currency pair, with hedging currently performance additive for many developed currencies. There is typically more variation in developing markets in terms of hedging cost or pick up.
- Regardless of approach, hedging costs or unhedged currency risks are typically included in the bottom-up assessment of investment opportunities. This approach provides investment managers clear relative value assessment across the region on a risk-adjusted basis.

Figure 6: Annualised hedging (cost) / benefit for AUD investors as at 31 January 2026



Source: LSEG Datastream. One-year forward points AUD as at 31 January 2026

Figure 7: Ten-year Asia currency performance versus AUD (indexed to 100 February 2016)



Source: LSEG Datastream.

The final word

Attractive risk-adjusted returns are available across a range of strategies with opportunities in both mid-market and large-scale assets. Historical underinvestment in Asia relative to developed western markets can provide investors with relative value from a pricing perspective as a result of lower competition for assets.

Further, relative to investment in western markets greater potential upside in returns can be achieved in the region in higher growth countries and sectors with strong demand fundamentals. In addition, the region offers diversification benefits, both from a geographic perspective and as a hedge to macroeconomic and geopolitical risks in western markets.

Infrastructure investment in Asia however needs to be considered in light of portfolio fit. For example, the region could be suitable for those asset owners seeking enhanced returns and would provide a logical extension of the existing strategy. Conversely, defensively focused infrastructure portfolios may not be seeking increased returns nor increased portfolio complexity. Therefore, the starting point for considering the suitability of investing in Asian infrastructure will be the asset owner's strategy for the infrastructure asset class.

Asia infrastructure investment requires a deep understanding of local markets, regulatory frameworks and other investment requirements, reflecting the highly fragmented nature of the continent. Local expertise is essential.

Given access is likely to be via an investment manager, due diligence of the manager is critical including an understanding of investment strategy, country and sector exposures, approach to governance, foreign currency management and overall risk-return profile.

Our team has conducted analysis of the Asia infrastructure market over a period of several years and we continue to have ongoing engagement with Asia-focused infrastructure managers across multiple strategies.

Learn more

Get in touch with your client team or a member of our Real Assets Team if you would like to learn more about the Asia infrastructure investment opportunity and how it can fit into your portfolio.

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