

Unlocking Asia's Infrastructure Potential

Opportunities in Energy and Digital
Infrastructure in Developed and Emerging Asia

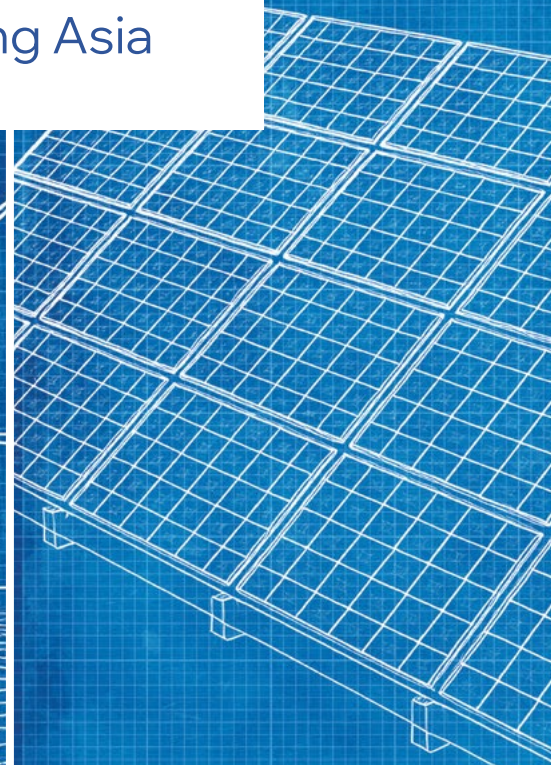
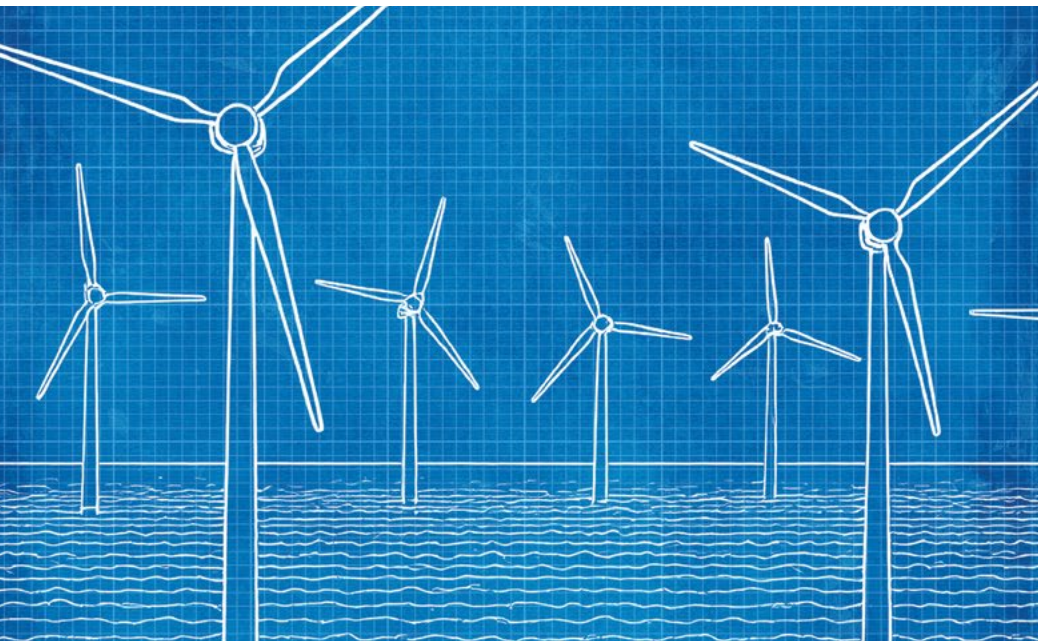


Table of Contents

Executive Summary	3
Asia's Trillion-Dollar Infrastructure Opportunity	5
The Three Megatrends Shaping Infrastructure Investing in Asia	12
I. Digitalization: Building the Backbone of Asia's Digital Economy	14
II. Energy Transition: The Path to Decarbonization	18
III. Regionalization: Strengthening Cross-Border Trade and Infrastructure in Asia	22
Capturing Asia's Next-Generation Infrastructure Growth	24

Executive Summary

Infrastructure investment in Asia¹ is undergoing a fundamental shift today with rapid urbanization, climate change, and aging assets. Historically, these infrastructure investments were centered around traditional assets such as roads, bridges, utilities, and public services - primarily funded by governments or state-owned enterprises (SOEs). However, total infrastructure investment demand today in Asia far exceeds supply, with an estimated US\$1.7 trillion needed annually through 2030 across energy, transport, digital, and other critical infrastructure sectors.²

Of this, digital infrastructure alone faces a projected US\$512 billion investment gap by 2040 in Asia Pacific.³ To bridge the US\$26 trillion infrastructure gap by 2030, private capital will be essential.

With Asia projected to account for 60% of global GDP in 2024,⁴ its role in the global infrastructure and energy transition is too significant to overlook. While traditional infrastructure remains critical, it is no longer the primary driver of Asia's future needs. Instead, a new wave of infrastructure investment is emerging to meet this demand - next-generation infrastructure.



Empyrion data center in South Korea

Three megatrends shape next-generation infrastructure:

- 1. Digitalization** - The rise of cloud computing, AI, e-commerce, and digital transformation drives demand for data centers, high-speed fiber networks, and 5G connectivity.
- 2. Energy transition** - Asia's decarbonization goals and net-zero commitments are accelerating investments in renewable energy (solar, wind, hydro) and power storage.
- 3. Regionalization** - While regionalization has long been a driver of economic growth in Asia, heightened geopolitical tensions have made resilient supply chains and energy independence an urgent priority. This shift has accelerated infrastructure investments to support intra-Asia trade, supply chain realignment, and cross-border industrial expansion.

Unlike North America and Europe, where markets are broadly recognized as mature and stable, Asia presents a spectrum of opportunities, ranging from well-established, institutional-grade markets to fast-growing economies that require a higher risk-reward approach.

This whitepaper explores how these megatrends are reshaping infrastructure investment in Asia, the challenges and opportunities they present for private capital, strategies for navigating an evolving landscape, and the industry outlook.

Private capital is increasingly vital in driving energy and digital infrastructure growth in Asia, complementing government efforts to meet rising demand.

James Chern, Managing Partner and CIO of Seraya Partners

Asia's Trillion Dollar Infrastructure Opportunity

Asia is at the epicenter of the global infrastructure transformation, presenting a compelling investment case for private capital.



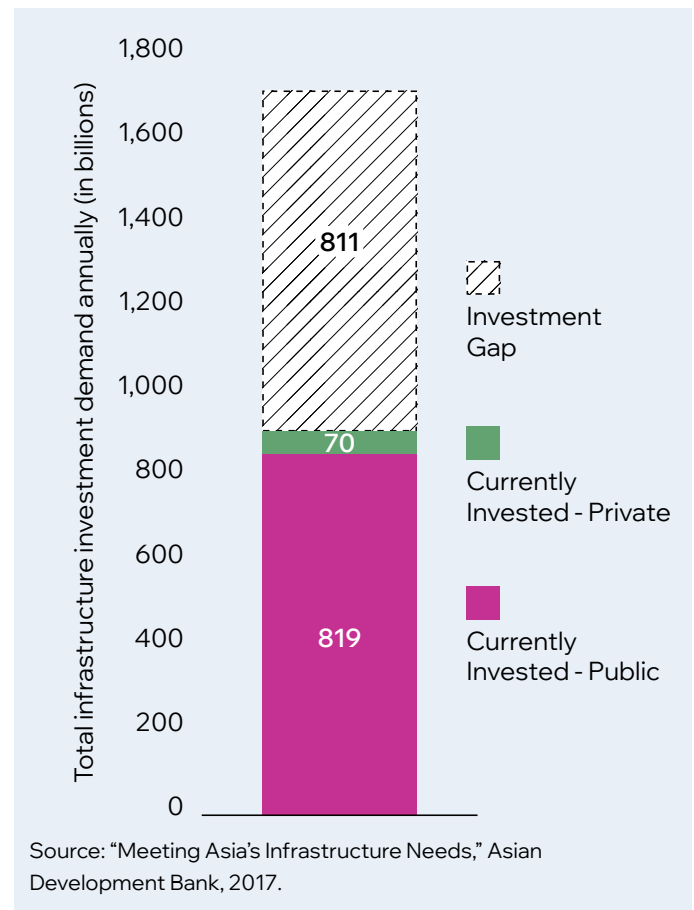
Asia's Economic Growth Will Drive Future Infrastructure Demand

Asia is at the epicenter of the global infrastructure transformation, presenting a compelling investment case for private capital. Strong macro tailwinds are driving demand, including a rapidly expanding middle class, accelerating urbanization, and structural expansion driven by supportive government policies. This growth is also partly fueled by decades of traditional infrastructure development and a recent influx of private capital investment into the region.

Asia's infrastructure investment remains underpenetrated compared to the US and Europe, creating diversification and high-growth opportunities. With infrastructure investment in Asia evolving rapidly in the last few years, early movers will be well-positioned to capture long-term value and higher risk-adjusted returns.

A closer look at these macroeconomic dynamics demonstrates Asia's rising influence on the global stage.

Figure 1: Infrastructure Investment Gap in Asia Annually vs. Current Funding Sources

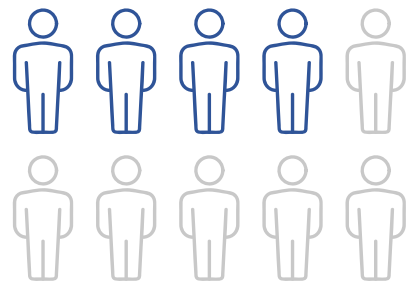


Key Macro Drivers of Asia

Infrastructure Growth

- ▶ **Growing middle class and consumption in Asia** - Asia is projected to drive 60% of global GDP growth in 2024. The region is also home to 4.8 billion people, with a middle-class population of two billion in 2020 which is expected to grow to 3.5 billion by 2030.⁶ A rising middle class has amplified the demand for advanced infrastructure.
- ▶ **Accelerating urbanization** - Asia's urban population is expected to grow by over 1.2 billion new urban residents by 2050 - equivalent to building a city like Seoul twice a year.⁷ This mass migration to urban areas is increasing pressure on existing traditional infrastructure, reinforcing the need for new infrastructure developments.
- ▶ **Structural expansion and supportive government policies** - Governments across Asia have been actively implementing strategic policies to drive infrastructure growth and investment. Initiatives such as Singapore's Smart Nation Initiative, Indonesia's National Strategic Projects (PSN), Japan's Green Transformation (GX) Program, South Korea's Digital New Deal, and Vietnam's National Transport Master Plan.

Additionally, regional economic agreements such as the Association of Southeast Asian Nations (ASEAN) and the Regional Comprehensive Economic Partnership (RCEP) have strengthened cross-border trade, investment, and infrastructure development, further positioning Asia as a global growth engine.



Approximately 40% of Asia's population are middle class.

Global Investor Interest in Asia's Infrastructure Boom

Asia's infrastructure investment remains underpenetrated compared to the US and Europe, creating diversification and high-

growth opportunities. With infrastructure investment in Asia evolving rapidly in the last few years, early movers will be well-positioned to capture long-term value and higher risk-adjusted returns.

Figure 2: Comparing Investment Dynamics in Mature vs. High-Growth Infrastructure Markets in Asia

Mature and Stable Markets (e.g., Singapore, Japan, South Korea)	High-Growth and Emerging Markets (e.g., Indonesia, Thailand, the Philippines)
Well-developed financial markets and institutional-grade regulatory frameworks	Rapid industrialization and digital transformation are driving infrastructure demand
Established investment hubs with strong governance and transparent legal systems	Investment regimes are becoming more stable despite evolving regulations
Strong government policy support for renewable energy (grid modernization, offshore wind)	Countries like Vietnam, Indonesia, and the Philippines have improved PPP frameworks and foreign investment policies, making infrastructure investments increasingly predictable
Mature AI/cloud ecosystems and well-established data infrastructure	Exploding demand for 5G, AI computer and digital infrastructure; fast-growing energy demand with battery storage and decentralized energy grid investments with strong return potential
Stable and predictable investment environment	Higher return potential, but investors must navigate policy risks and financing complexities
<p>Frontier markets such as Cambodia, Myanmar, and Nepal offer potentially higher returns but with increased investment risks, including sovereign risk, currency volatility, and high interest rates.</p> <p>By balancing exposure to stable and high-growth markets, investors can mitigate risk while capturing Asia's long-term infrastructure opportunity.</p>	

Source: Seraya Partners Analysis – Comparing Investment Dynamics in Mature vs. High-Growth Infrastructure Markets in Asia

The combination of strong macroeconomic fundamentals, long-term contracted cash flows, and the sector's resilience during economic downturns has attracted growing interest from global investors. Institutional investors, including sovereign wealth funds, pension funds, and private equity firms, are increasingly exploring opportunities in Asia's high-growth infrastructure sectors, recognizing the region's need for large-scale investment in digital infrastructure and renewable energy.

This trend is reflected in the expanding presence of global investors in Asia's infrastructure market. Both local firms (such as PAG, Primavera, and MBK Partners) and global players have actively built infrastructure-focused investment strategies in the region, signaling rising confidence in Asia's infrastructure potential.

At the same time, large-scale transactions in the region over the last few years demonstrate how Asia's infrastructure market is maturing, attracting some of the world's largest institutional investors. These transactions include the 2019 acquisition of Vena Energy, one of the region's leading renewable energy developers, by Global Infrastructure Partners (GIP), the Public Sector Pension Investment Board (PSP), and China Investment Corporation (CIC); KKR's SGD\$1.1 billion data center JV with Singtel in 2023; and Blackstone and CPP Investments' A\$24 billion acquisition of AirTrunk in 2024.

The region is pioneering the energy transition with investment in floating solar, offshore wind, hydrogen, and energy storage. At the same time, the rapid expansion of AI-driven digital infrastructure, sustainable data centers, and next-generation connectivity makes it a hotspot for tech-enabled investments,

Jingyi Zhang, Senior Investment Officer of AIIIB

Asia's Infrastructure Market Remains Undercapitalized

Despite growing investor interest, Asia's infrastructure market remains undercapitalized relative to its needs. According to the Asian Development Bank (ADB), private infrastructure investment in Asia represents less than five percent of total global infrastructure investment, far below the region's economic weight and infrastructure demands.

Several factors contribute to this gap:

- ▶ **Public sector dominance** - The public sector accounts for 90%⁸ of total infrastructure investment in Asia. Unlike in Western markets, where private capital plays a substantial role in infrastructure financing, many Asian governments rely heavily on state-led funding and execution. As infrastructure needs continue to grow, private capital is becoming increasingly essential in complementing public investment, helping to bridge funding gaps and accelerate the development of critical energy and digital infrastructure.
- ▶ **Limited privatization appetite** - Many Asian countries have a longstanding reliance on public ownership and infrastructure management. Political and public resistance to privatization often makes it challenging for private investors to enter key sectors such as transport, utilities, and energy infrastructure.
- ▶ **Fragmented and complex market** - Unlike more uniform regulatory environments in the US or Europe, Asia is highly diverse, with each country having its regulatory landscape, legal frameworks, and market practices. Successful infrastructure investment in Asia benefits from deep

local engagement and an understanding of country-specific risks.

- ▶ **Risk concerns** - Infrastructure projects inherently require long-term capital commitments, and Asia is no exception. Additional factors such as currency volatility, political stability, and contract enforceability can influence investment decisions, making risk mitigation strategies critical for unlocking Asia's full potential.

While there are risk considerations, Asia's infrastructure sector presents significant opportunities for private capital and attractive risk-adjusted returns, particularly as governments increase efforts to attract investment and implement new financing models to de-risk projects. In the end, success in this market requires a nuanced understanding of regional dynamics, sector-specific risks, and evolving regulatory frameworks.

Navigating the Challenges

1. **Understanding the local context to mitigate risks** - Asia is not a homogenous market, and infrastructure investment requires deep local expertise to navigate its complexities effectively. Investors with long-term commitments and local partnerships are better positioned to assess country-specific regulatory and counterparty risks, identify mispriced or mismanaged risks resulting from a lack of local market knowledge, and develop stronger stakeholder relationships. These relationships are essential for securing permits, structuring deals, and managing long-term assets.

2. **Identifying high-impact infrastructure bottlenecks** - While investment in traditional infrastructure assets, such as power generation, fiber networks, and logistics hubs continues, some of Asia's most pressing infrastructure opportunities lie in addressing transmission, distribution, and connectivity bottlenecks. These underinvested areas are critical to unlocking the full potential of the region's infrastructure and ensuring long-term scalability and efficiency.

3. **Tailoring investment strategies by market** - The approach to infrastructure investment differs significantly depending on each market's maturity and risk profile. For example, in developed Asia (e.g., Japan, South Korea), we see relatively stable regulatory frameworks with government-backed incentives for renewables, offshore wind, battery storage, LNG power, and data centers.

These markets offer institutional-grade stability, clear regulatory frameworks, and strong rule of law, providing a similar investment environment and risk profile to Western Europe and North America for long-term infrastructure investment. We also see demand for sustainable infrastructure solutions amid national decarbonization targets.

Emerging Asia (e.g., Indonesia, Vietnam, and the Philippines) presents high-growth potential but can also involve greater regulatory uncertainty and counterparty risks.

4. **Emerging financing models and risk mitigation strategies** - Asian governments and financial institutions are developing

new mechanisms to attract private capital while reducing investment risks. These include public-private partnerships, infrastructure investment trusts (InvITs), green bonds, blended finance, and sovereign guarantees.

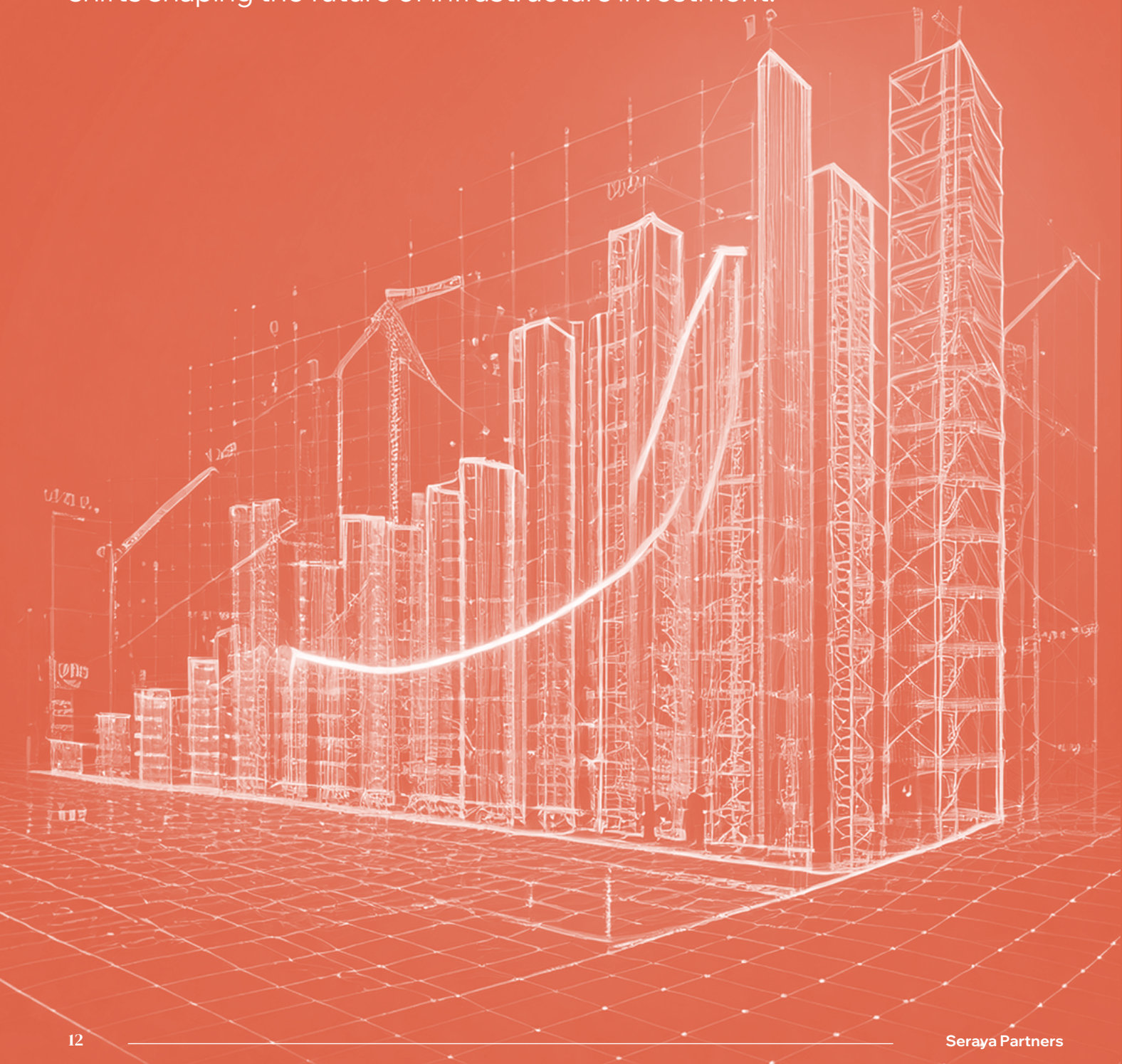
The scale and complexity of Asia's infrastructure needs present challenges and opportunities for private investors. As regulatory frameworks evolve and financing models mature, private capital will play an increasingly important role in shaping the next generation of infrastructure in Asia.



Cyan Renewables' offshore wind farm with emergency response vessel

The Three Megatrends Shaping Infrastructure Investment in Asia

As private capital seeks to navigate Asia's complex yet high-growth infrastructure landscape, it is essential to recognize the structural shifts shaping the future of infrastructure investment.



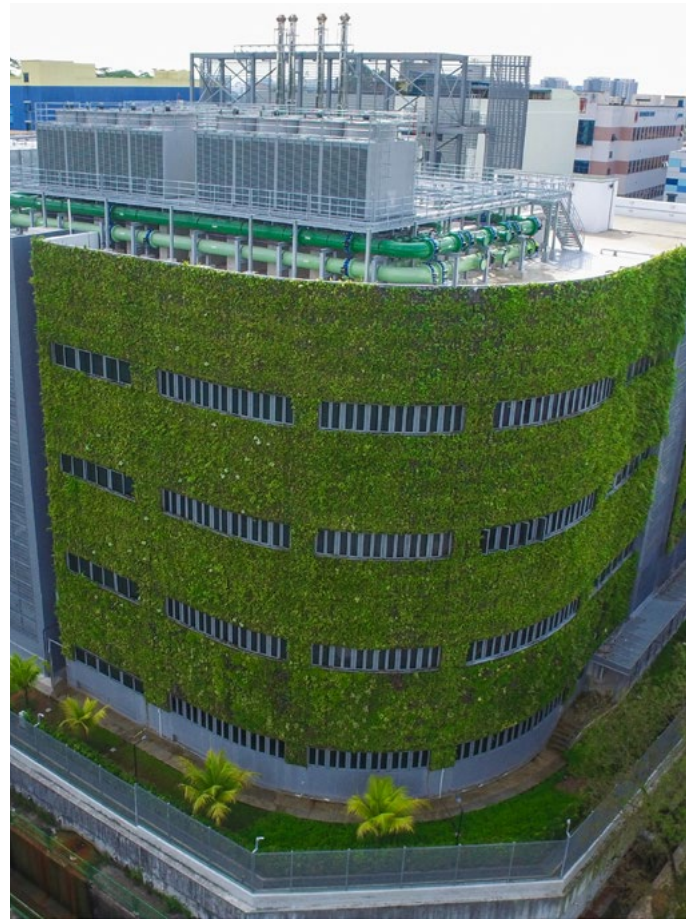
The Three Megatrends Shaping Infrastructure Investment in Asia

As private capital seeks to navigate Asia's complex yet high-growth infrastructure landscape, it is essential to recognize the structural shifts shaping the future of infrastructure investment.

We have identified three key megatrends - digitalization, energy transition, and regionalization - that are not only driving infrastructure demand but also reshaping how investors assess risk, structure deals, and unlock stable long-term value:

- ▶ **Digitalization** - The rise of cloud computing, AI, e-commerce, and digital transformation drives demand for data centers, high-speed fiber networks, and 5G connectivity.
- ▶ **Energy transition** - Asia's decarbonization goals and net-zero commitments are accelerating investments in renewable energy (solar, wind, hydro) and power storage.
- ▶ **Regionalization** - While regionalization has long been a driver of economic growth in Asia, heightened geopolitical tensions have made resilient supply chains and energy independence an urgent priority. This shift has accelerated infrastructure investments to support intra-Asia trade, supply chain realignment, and cross-border industrial expansion.

Understanding these megatrends is critical for investors who are looking to deploy capital in Asia's infrastructure sector, as these shifts will uncover the most attractive sectors and markets, drive regulatory developments, and influence investment returns and risk profiles.



Empyrion data center in Singapore

I. Digitalization: Building the Backbone of Asia's Digital Economy



Home to over 55% of the world's Internet users and an expanding middle class,⁹ Asia is experiencing strong demand for high-speed connectivity, cloud computing, and data storage. This shift is driving large-scale investment in data centers, fiber-optic networks, and 5G deployment, making digital infrastructure a critical enabler of economic growth.





With increasing demand for data connectivity, cloud storage, and high-performance computing, private capital will play a vital role in scaling and sustaining Asia's digital economy. Additionally, DeepSeek's advancements in lowering CAPEX costs for AI have the potential to drive new demand for AI infrastructure, which could accelerate investment opportunities in Asia.

For investors, digital infrastructure presents long-term, scalable investment opportunities. This is supported by stable, contracted revenue streams from cloud providers and telecom operators; in addition to inflation-hedged returns, backed by essential infrastructure demand, strong government support, and private-sector participation.



MMA Crystal support vessels

Market Drivers for Digital Infrastructure Investment in Asia

 Surging Data Consumption and Cloud Expansion	 Growth in 5G and Fiber Connectivity	 AI, Edge Computing, and Emerging Technologies	 Government Support and Policy Incentives
<p>The cloud computing market in Asia-Pacific is growing at a compound annual growth rate of approximately 17%,¹⁰ fueled by AI adoption, e-commerce, and digital payments.</p>	<p>Governments are prioritizing next-generation telecom infrastructure, accelerating fiber-optic and 5G network deployment.</p>	<p>AI-driven applications, from predictive analytics to real-time processing, are increasing the need for high-speed, low-latency data infrastructure.</p>	<p>Many Asian governments are offering tax incentives and regulatory frameworks to attract private investment into data centers and fiber networks.</p>
<p>Enterprise digitalization and smart city initiatives are increasing demand for high-performance computing and secure data storage.</p>	<p>Private sector investment is driving fiber broadband expansion, particularly in emerging markets such as Indonesia and the Philippines.</p>	<p>Edge computing and decentralized networks are shaping the future of digital infrastructure investment in Asia's urban centers.</p>	<p>Data sovereignty and localization laws are increasing demand for regional data storage solutions, further strengthening the digital infrastructure investment case.</p>
<p>Global technology firms, including AWS, Microsoft Azure, and Google Cloud, are expanding their data center footprints across the region.</p>			

Investment Opportunities in Digital Infrastructure

Today, three emerging investment themes are shaping the future of digital infrastructure investment in Asia:

1. **The demand for hyperscale data centers and broadband capacity is surging**, driven by cloud adoption, AI workloads, and enterprise digitalization. As global tech firms, including AWS, Microsoft, Google Cloud, and Alibaba Cloud, expand their regional operations, institutional investors are actively participating in large-scale data center developments through platform investments, private equity partnerships, and infrastructure funds.
2. **Fiber-optic and 5G connectivity are other high-growth areas** where private investment is accelerating the expansion of high-speed networks to improve Internet penetration and regional connectivity. Governments and telecom operators are actively deploying fiber broadband and 5G networks, particularly in Southeast Asia and South Asia, where demand for reliable, high-speed connectivity is increasing due to urbanization and industrial digitalization.
3. **The rapid expansion of data centers and fiber infrastructure is driving significant energy demand.** Hyperscale data centers, critical for AI workloads, require reliable and scalable power solutions. As deployment accelerates, energy availability and stability are becoming key investment priorities, linking data center growth with energy infrastructure development.

Despite the strong investment case for digital infrastructure, several challenges remain that institutional investors must navigate:



Regulatory and Compliance Challenges

Data localization laws vary across jurisdictions, requiring investors to assess regulatory risks when structuring data center investments. Policymakers are introducing stricter data protection rules, increasing the need for localized data storage solutions and compliance-driven infrastructure investments.



Sustainability and Energy Efficiency

Data centers are among the most energy-intensive infrastructure assets, leading to a growing focus on renewable-powered digital infrastructure. Institutional investors increasingly prioritize energy-efficient cooling technologies, carbon-neutral operations, and hybrid power solutions to ensure long-term sustainability.



Market Fragmentation and Scalability

Data infrastructure investment strategies vary significantly across Asian markets. Investors must adopt localized approaches and strategic partnerships to navigate regulatory differences, varying demand drivers, and infrastructure scalability challenges in emerging economies.

Looking ahead, the following trends will define the next phase of digital infrastructure investment in Asia:

- ▶ **Increased regional partnerships to support advanced cloud infrastructure**
- With cross-border data flows and cloud interconnectivity expanding, collaboration between private investors, technology providers, and governments will be key to building next-generation cloud infrastructure.

At the same time, increasing government backing for digital transformation is further enabling private capital to play a more significant role in bridging funding gaps and accelerating infrastructure development across the region.

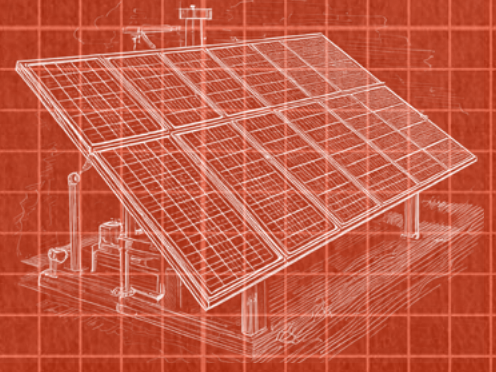
- ▶ **Integration of energy-efficient solutions into data infrastructure** - As data centers remain among the most energy-intensive infrastructure assets, investors are prioritizing renewable-powered facilities and energy-efficient cooling systems to ensure long-term sustainability.

As Asia's economy becomes increasingly data-driven, digital infrastructure is evolving into an essential asset class for institutional investors.

Key Considerations for Investors

1. Which markets in Asia offer the most scalable opportunities for digital infrastructure investment?
2. How can institutional capital be deployed effectively in a rapidly evolving regulatory landscape?
3. What role will sustainable data infrastructure play in shaping the future of digital asset investments?

II. Energy Transition: The Path to Decarbonization



Asia's energy demand is rising quickly, driven by a rapidly expanding middle class, rapid urbanization, and industrialization. By 2040, the Asia-Pacific region is expected to account for 50% of global GDP. However, this growth comes with an energy challenge, Asia remains heavily dependent on fossil fuels, consuming 80% of the world's coal power and generating more than 40% of global CO₂ emissions.¹¹

Despite these challenges, Asia is at the forefront of the global energy transition. The region is the largest exporter of low-emissions technologies, with China producing 80-90% of global solar modules, wind turbines, and EV batteries. Japan and South Korea lead the way in battery supply chains and energy storage investments.

In addition, governments and corporations across Asia are accelerating net-zero commitments, aligning with Paris Agreement targets. They are also responding to trade pressures from global partners such as Europe, which is introducing carbon tariffs on high-emission imports.





With 40% of the world's energy transition investments expected to flow into Asia by 2050, the region is poised for large-scale decarbonization initiatives. Key investment areas include renewable energy (solar and wind), energy storage, biofuels, and

electrification of transport and cooling systems, alongside efforts to decarbonize national grids.

As demonstrated by Seraya Partners' landmark take-private acquisition of MMA Offshore through Cyan Renewables, private capital is critical to this shift. Completed in July 2024, this transformative deal, valued at approximately A\$1.1 billion (US\$702 million), is the largest take-private transaction in the Asia-Pacific region's offshore wind energy services sector. This strategic move underscores the growing role of private investment in scaling renewable energy infrastructure, particularly in offshore wind and marine decarbonization solutions.

Asia's positive momentum and market-scale opportunities make it a compelling destination for private capital seeking long-term, sustainable investment returns.

Market Drivers for Energy Transition Investment in Asia

 Decarbonization and Climate Commitments	 Growth in Renewable Energy and Battery Storage	 Coal-to-Clean Transition Initiatives	 Grid Modernization and Energy Resilience
<p>Over 300 major companies based in Asia-Pacific have pledged to achieve net-zero emissions, driving demand for renewable power solutions.¹²</p>	<p>Asia must invest \$1.7 trillion annually in infrastructure to maintain growth while transitioning to a low-carbon economy.</p>	<p>Brown-to-green projects are gaining traction, converting coal-fired power plants to solar, wind, and battery energy storage.</p>	<p>Many Asian power grids are aging and inefficient, requiring the deployment of smart grids and digital energy infrastructure to integrate renewables at scale.</p>
<p>Asia's industrial decarbonization push is accelerating corporate demand for green electricity, carbon capture, and energy efficiency solutions.</p>	<p>Asia is currently the largest contributor to global renewable growth and is on track to triple its capacity by 2030, which aligns with the Paris Agreement.¹³</p>	<p>Institutional investors actively acquire fossil fuel assets for repurposing, reducing stranded asset risks while supporting climate goals.</p>	<p>Microgrids and decentralized power networks are becoming essential in emerging markets with unreliable electricity supply.</p>
	<p>Achieving cost parity in renewable energy - In many Asian markets, such as China, solar power has reached cost parity with fossil fuels. Lower renewable energy costs and government incentives are accelerating private investment in solar, wind, and battery storage.</p>	<p>While coal remains dominant, natural gas is transitional in decarbonization, particularly in markets such as Japan, South Korea, and India. As Asia shifts toward renewables, natural gas offers a lower-carbon alternative.</p>	

Investment Opportunities in the Energy Transition Space

As Asia accelerates its shift toward a low-carbon economy, investment in renewable energy, battery storage, and grid infrastructure is scaling rapidly. Investors are focusing on legacy asset transitions, energy storage solutions, and modernized transmission networks to support Asia's decarbonization.

Key investment themes

- ▶ **Brown-to-green transition** - The shift from fossil fuel assets to renewables is gaining momentum, with institutional investors acquiring aging coal and gas-fired power plants for redevelopment. In Japan and South Korea, companies are actively converting coal-fired plants into solar and wind hubs, often integrating grid-scale battery storage for enhanced efficiency.
- ▶ **Battery storage and grid infrastructure** - With the rapid growth of solar and wind energy, Asia's power grids need large-scale battery storage and modernized transmission networks to manage supply-demand fluctuations. China and India are leading in energy storage investments, while Singapore and South Korea are deploying smart grid technologies and microgrids to improve grid stability.

Despite the significant investment opportunities in Asia's energy transition, there are key challenges in regulatory landscapes, market inefficiencies, and financing constraints for consideration.

These include:



Dominance of SOEs in the Energy Sector

In countries like China, India, and Indonesia, state-owned enterprises (SOEs) control the majority of power generation and transmission assets, making it difficult for private investors to compete or enter the market without partnerships.



Financing Hurdles for Large-Scale Renewable Projects

Utility-scale renewable energy projects, such as offshore wind farms, solar power plants, and energy storage systems, require high upfront capital and long payback periods.



Regulatory Uncertainty and Policy Misalignment

While many governments are setting ambitious net-zero targets, inconsistent policies, complex permitting processes, and sudden regulatory shifts can create uncertainty for investors.

To overcome these challenges, investors must carefully navigate policy uncertainty, financing hurdles, and infrastructure bottlenecks to unlock scalable and sustainable returns. Strategic partnerships with local players, a deep understanding of regulatory frameworks, and long-term capital commitment will be critical in capturing Asia's decarbonization growth.

In 2017, in one of Asia's largest renewable energy transactions, a consortium including the Public Sector Pension Investment Board (PSP) and China Investment Corporation (CIC) acquired Equis Renewables for USD\$5 billion. The deal underscores the growing role of private capital in accelerating Asia's energy transition. It also highlights how institutional investors are scaling renewable energy platforms and consolidating solar, wind, and battery storage assets across the region to meet rising demand for decarbonization and corporate clean energy commitments.

At the same time, reintroducing Trump-era tariffs could also have unintended benefits for Asian infrastructure investors by lowering CAPEX costs. As tariffs redirect supply chains initially intended for the US to Southeast Asia, key infrastructure components, such as solar panels, batteries, and renewable energy equipment, could become more readily available and cost-competitive. This shift presents an opportunity for investors looking to scale energy transition projects while benefiting from a more favorable supply chain environment.

However, investors must carefully navigate policy uncertainty, financing hurdles, and infrastructure bottlenecks to unlock scalable and sustainable returns. Strategic partnerships with local players, a deep understanding of regulatory frameworks, and long-term capital commitment will be critical in capturing Asia's decarbonization growth.

Key Questions for Investors

1. With a potential pullback on sustainability commitments under a Trump administration, how is Asia responding, and what does this mean for the region's energy transition investments?
2. Which markets in Asia provide the most scalable opportunities for energy transition investments?
3. How can investors structure deals to navigate SOE dominance and regulatory constraints?
4. What financing structures can be used to de-risk large-scale renewable energy projects?
5. How can private capital contribute to grid modernization and battery storage expansion?

III. Regionalization: Strengthening Cross-Border Trade and Infrastructure in Asia



Asia is at the center of global trade shifts, with intra-regional trade strengthening economic interdependence. As the world’s second-largest integrated trade region after Europe, Asia’s intraregional trade value - measured as a share of the region’s total trade volume - has grown from 54% in 2000 to 57% in 2022,¹³ while other regions have seen declines. This trend is particularly evident in the deepening economic ties between China and ASEAN, with ASEAN accounting for 15% of China’s total trade in 2023, up from 10% in 2010, and China’s share of ASEAN trade rising from 12% to 20% over the same period.¹⁴ The Regional Comprehensive Economic Partnership (RCEP), the world’s largest free trade agreement covering 15 economies in the Asia-Pacific region, is set to accelerate this regional integration further.

At the same time, global supply chains are undergoing a structural shift, with companies diversifying manufacturing and production away from China into Southeast Asia. Vietnam, Indonesia, and Thailand have become key beneficiaries of supply chain realignment, attracting foreign direct investment (FDI) from multinational corporations seeking to expand regional manufacturing capacity.

Additionally, Johor Bahru (Malaysia) is emerging as an extension of Singapore’s economic ecosystem, attracting businesses looking for lower operational costs while still benefiting from Singapore’s financial and trade networks.

Cross-border joint ventures (JVs) and strategic collaborations are also accelerating, such as between Japanese firms and Southeast Asian partners. Japanese corporations are expanding their regional manufacturing and infrastructure footprint, leveraging local partnerships to co-develop energy projects, industrial facilities, and smart logistics networks. These cross-border investments highlight the increasing role of regional alliances in driving infrastructure expansion and economic integration.



Operations and maintenance vessels

Investment Opportunities in Regionalization

As regional integration accelerates, regional mega-projects and new trade corridors, such as cross-border rail networks and transnational energy grids, are impacting global commerce and supply chains, driving increased private capital investment in infrastructure and connectivity projects.

- ▶ **Integrated energy infrastructure** - Investments in cross-border power grids, LNG infrastructure, and multi-country renewable energy projects to enhance energy security.
- ▶ **Smart and sustainable transportation networks** - Expansion of regional rail corridors, high-speed freight systems, and green port infrastructure to facilitate trade.
- ▶ **Digital infrastructure hubs** - Johor Bahru (Malaysia) is emerging as a key data center hub alongside other strategic locations in Southeast Asia. This trend underscores the growing need for cross-border digital infrastructure, fiber networks, and cloud connectivity to support the region's expanding digital economy.

Despite strong regionalization trends, investors face challenges in executing cross-border infrastructure projects, including:

- ▶ **Regulatory fragmentation** - Differing policies, trade regulations, and infrastructure standards across Asian markets create complex investment landscapes.
- ▶ **Cross-border financing and risk allocation** - Large-scale projects require multi-party financing agreements, often

involving governments, development banks, and private capital, which increases their financial complexity.

- ▶ **Geopolitical tensions and trade barriers** - Rising geopolitical uncertainty, tariffs, and supply chain restrictions may impact long-term investment strategies.

As Asia's economic integration deepens, regionalization will continue to drive demand for large-scale infrastructure investments. At the same time, Trump-era tariffs, semiconductor export controls, and China's ongoing decoupling from the US are reshaping supply chains and investment flows, adding new layers of uncertainty. These factors influence project financing, material costs, and technology access, requiring investors to navigate an increasingly complex landscape when deploying capital across borders.

Key Consideration for Investors

1. Which countries offer the most investable opportunities in regional logistics and infrastructure?
2. How can private capital structure cross-border energy and transportation deals to mitigate geopolitical risks?
3. What role will regional trade agreements play in shaping future infrastructure demand?
4. How can investors navigate multi-stakeholder financing structures for regional projects?

Capturing Asia's Next-Generation Infrastructure Growth

Asia's infrastructure investment landscape is undergoing a structural shift driven by urbanization, regional economic integration, and the global energy transition.



The Future of Infrastructure Investing in Asia

Asia’s transition toward clean energy is accelerating, with renewables expected to play a dominant role in the region’s energy mix. Southeast Asia, in particular, is set to experience a significant rise in renewable energy adoption, driven by government commitments, policy incentives, and technological advancements.

This shift reflects a broader transformation across Asia, where renewables are steadily replacing fossil fuels as the primary energy source. As energy demand continues to rise, solar, wind, and other clean energy sources are expected to drive long-term investment opportunities.

Figure 3: Projected Growth in % Share of Renewable Energy in Southeast Asia (2022-2050)

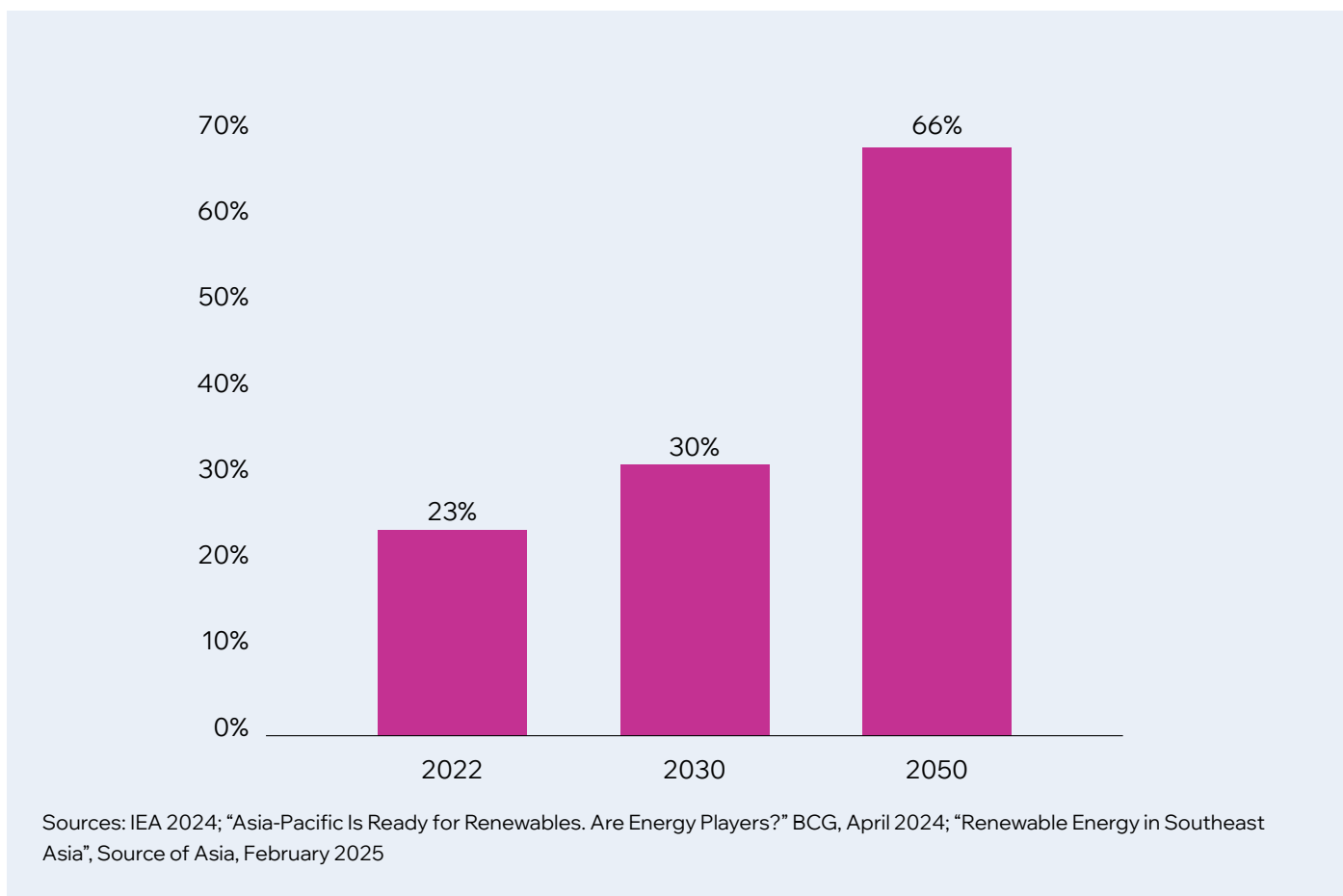
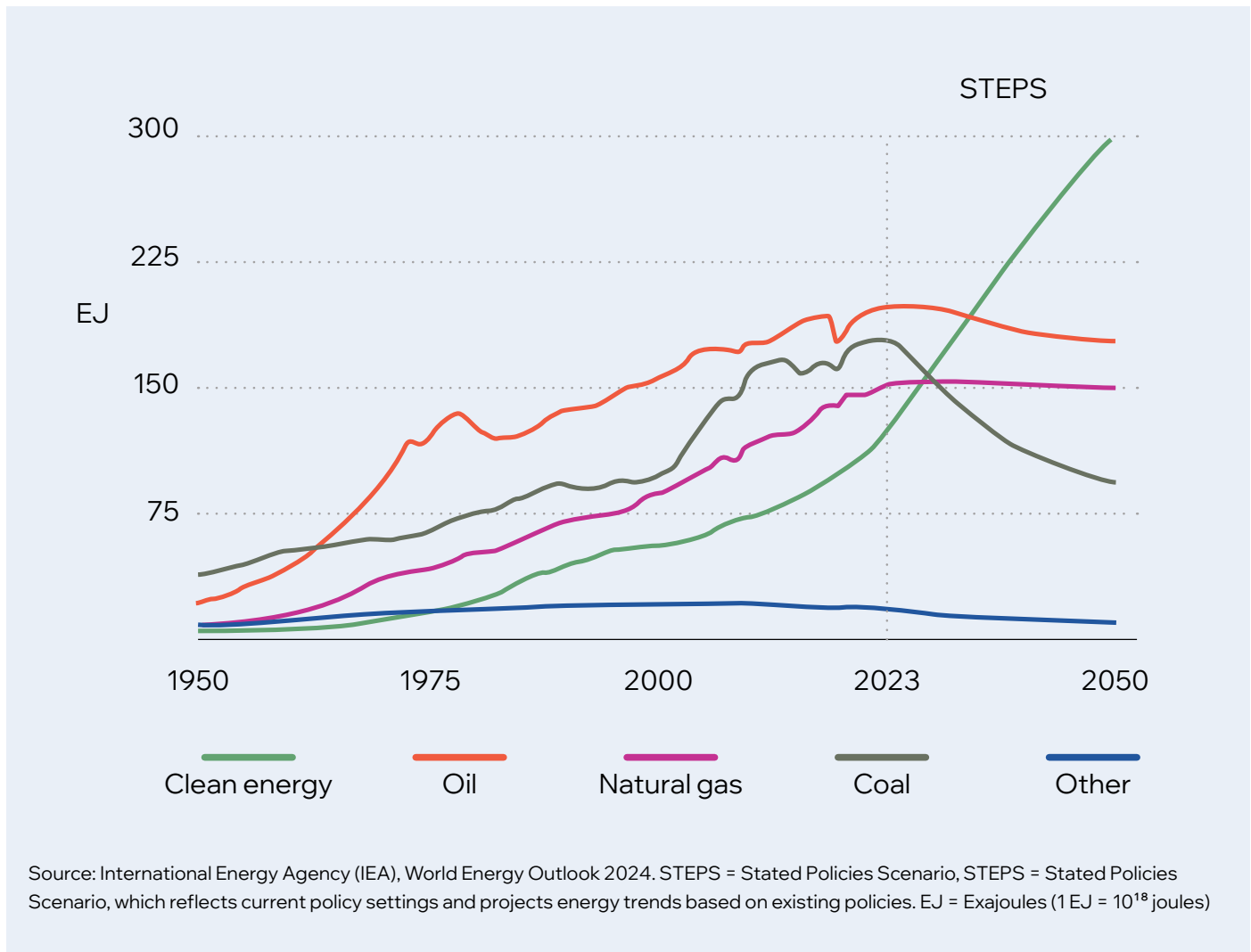


Figure 4: Rise of Renewables : The Shift from Fossil Fuels to Clean Energy



Recent fundraises, such as KKR Asia’s Asia Pacific Infrastructure Investors II Fund US\$6.9 billion fund in 2023 and Stonepeak’s Infrastructure Fund II US\$3.5 billion Asia infrastructure fund, reflect strong institutional interest in the sector. These investments signal increasing confidence in Asia’s ability to generate long-term infrastructure returns.

Compared to more developed infrastructure markets in North America and Europe, Asia can offer higher risk-adjusted returns, with opportunities in mid-market projects less saturated by global capital. Asia’s infrastructure investment landscape also provides diversification benefits, allowing investors to hedge macroeconomic risks in Western markets while accessing growth sectors with strong demand fundamentals.

Infrastructure investment in Asia requires a deep understanding of local markets, regulatory frameworks, and business dynamics. Unlike more mature infrastructure sectors in developed markets, Asia’s infrastructure landscape is highly fragmented, with country-specific regulations, state-owned enterprise (SOE) dominance, and varying capital market conditions.

Key considerations include:



On-the-Ground Presence

Access to local teams, government stakeholders, and industry networks is critical for navigating regulatory approvals, sourcing deals, and executing projects efficiently.



Localized Investment Strategies

Infrastructure opportunities in developed Asia (Japan, Korea, Singapore) differ from those in emerging Southeast Asia (Indonesia, Vietnam, the Philippines), requiring market-specific investment strategies.



Regulatory and Policy Navigation

Many Asian governments control critical infrastructure assets, requiring investors to work closely with policymakers and local partners to align with national development priorities.

Infrastructure must evolve as markets undergo digital transformation, energy transitions, and regionalization to support these structural shifts. Investments in next-generation infrastructure focus on high-growth sectors where private capital plays a critical role in addressing changing economic, technological, and sustainability demands.

Seraya Partners' investment strategy targets sectors with strong structural demand, stable cash flows, and long-term sustainability potential, ensuring they contribute to the next phase of infrastructure development.

These include:

- ▶ **Digital infrastructure and data centers** - The rapid expansion of cloud computing, AI, and data sovereignty regulations is driving demand for hyperscale and edge data centers. Seraya focuses on developing and scaling sustainable data center platforms across Singapore, Korea, Japan, and other developed Asian markets.

- ▶ **Renewable energy and offshore wind infrastructure** - As governments and corporations accelerate their net-zero targets, solar, wind, and battery storage investment is scaling rapidly. Seraya's platform-building approach focuses on offshore wind farm vessels and energy transition infrastructure to support the growing pipeline of renewable projects in Asia.
- ▶ **Energy storage and grid modernization** - The growth of intermittent renewable energy sources has created a critical need for grid-scale battery storage, transmission infrastructure, and smart energy management systems. Seraya targets investments in energy storage solutions and grid resilience projects that enhance the stability and reliability of renewable energy integration.

Despite strong capital inflows into Asian infrastructure, investors face structural challenges that require careful evaluation of regulatory landscapes, financing models, and market entry strategies

As regional economies continue integrating and governments scale their infrastructure initiatives, Asia is expected to remain a key destination for private capital investment. The energy transition, digital connectivity, and mobility transformation will drive sustained investment demand over the next decade. However, success will depend on effective local execution, navigating regulations, and structuring capital-efficient investments.

Investors evaluating Asia’s next-generation infrastructure opportunities should focus on scalable projects with strong demand fundamentals, resilient revenue models, and deep local market expertise. Those who leverage local partnerships, adapt to regulatory complexities, and execute efficiently will be best positioned to capture long-term value in Asia’s evolving infrastructure landscape.



Empyrion data center in Taiwan

Endnotes

1. Source: “Meeting Asia’s Infrastructure Needs,” Asian Development Bank, 2017.
2. Source: “How to Make the Most of the Digital Infrastructure Boom in APAC,” CBRE, 2024.
3. Source: “The Future is Asian,” World Economics, February 2025.
4. Source: “Global Overview – Renewables 2024, International Energy Agency (IEA),” 2024.
5. Source: “The Unprecedented Expansion of the Global Middle Class,” Brookings Institution, 2017.
6. Source: “Urbanization in Asia and the Pacific Region,” UN-Habitat, 2020.
7. Source: Ministry of Finance (Singapore), August 2019.
8. Source: DataReportal, January 2023.
9. Source: “Asia Pacific Cloud Computing Market Size Report,” 2030, Grand View Research, December 2024.
10. Source: “Coal Mid-Year Update,” IEA, July 2024.
11. Source: “Net Zero Pledges in Asia Pacific,” ISS Insights, April 2023.
12. Source: “Tripling Renewables by 2030: Interpreting the Global Goal at the Regional Level,” Climate Analytics, February 2024.
13. Source: “Asia: The Epicenter of Global Trade Shifts,” McKinsey and Company, September 2024.
14. Source: “Renewable Energy in Southeast Asia, Source of Asia,” February 2025.

About Seraya Partners

Seraya Partners is the first Asia-based independent private equity fund for next-generation infrastructure investing, headquartered in Singapore. With US\$1.3 billion in assets under management (AUM), Seraya Partners targets control-oriented, middle-market platform investments in next-generation infrastructure, focusing on the digital infrastructure and energy transition sectors, primarily within the developed Asia-Pacific region and Southeast Asia. Seraya has offices in Singapore, Kuala Lumpur, Seoul, and Tokyo.

www.serayapartners.com



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